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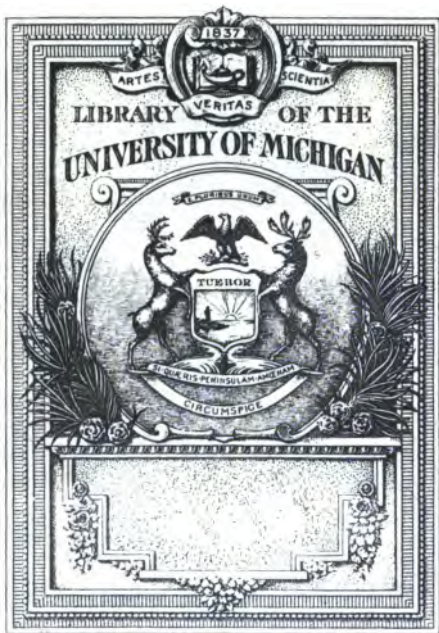
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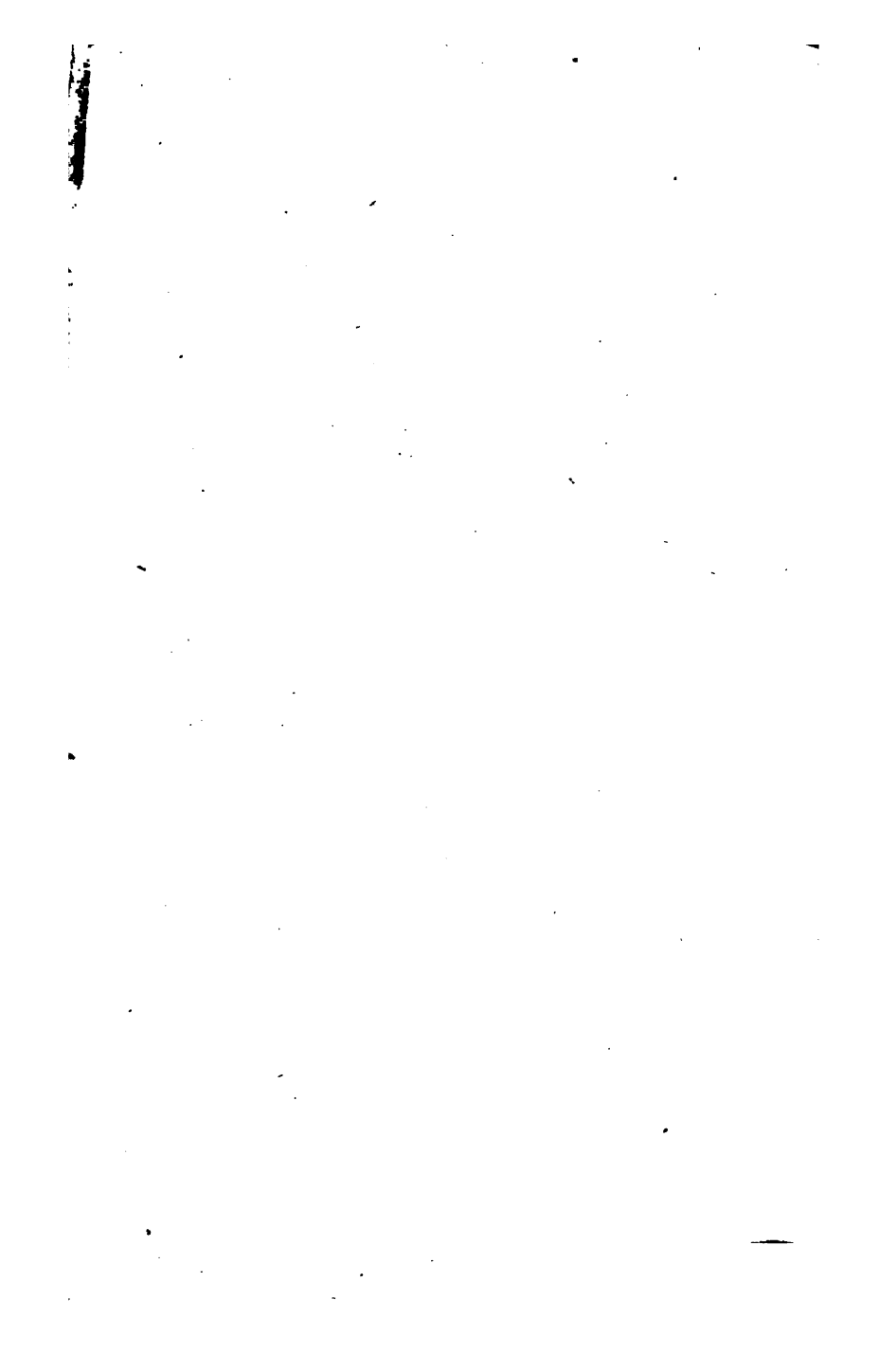


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CONVERSATIONS

ON

NATURE AND ART.

"Je n'étudie pas pour devenir savant, mais pour me rendre meilleur."
Lettre de St. Augustin à St Jérôme.

PHILADELPHIA:
LEA & BLANCHARD,
SUCCESSORS TO CAREY & CO.

.....
1839.

Mrs. Eliz. Rathbone
at.
1-16-1923

Philadelphia:
T. K. & P. G. COLLINS, Printers,
No. 1 Lodge Alley.

CONTENTS.

CHAPTER I.

PRINTING AND LIBRARIES.

	PAGE
Introduction.—Aldini.—Italics.—Octavos.—Ink.—Typographical Academy.—Inscription over the Library of Aldus.—Dolphin.—Price of Books.—Cosmography.—Hide.—Countess of Anjou.—Bishop of Winchester.—Louis XI.—Libraries of John and Charles V.—Ignorance of the early Ages.—Council of Narbonne.—Library of Ptolemy Philadelphus.—Destruction of Books.—Cromwell.—Constable Bourbon.—Taking of Buda.—Alexandrian Library.—Discovery of MSS.—Calligraphes.—Sir R. Cotton.—Maio.—Palimpsests.—Books the Tribute of the Conquered.—The Pandects of Justinian.—Treaty of Tolentino.—Haroun Al Raschid.—Clepsydra.—Al Mamoun.—Sir William Jones	13

CHAPTER II.

PAPYRUS MANUSCRIPTS.

Papyri of Herculaneum.—Their Discovery.—Method of unrolling them.—Only written upon one Side.—Titles, where placed.—Present State of the 1756 MSS.—Papyrus Paper

	PAGE
—How made.—Papyrus at Syracuse.—Chevalier Lando- lina.—Laws set to Music.—Teutonic Paraphrase of the Bible.—Cædmon.—Arundelian Marbles.—Wills of the Roman Soldiers.—Wood.—Bone Memoranda.—Wax.— Household Book of Philip le Bel.—Talipot Tree.—Bark. Books.—Indian Paper.—Linen Cloth.—Skins.—Gold.— MSS.—Gradual of St. Gregory.—Parchment.—Purple Vellum.—Silk Paper.—Cotton.—Linen.—Codex Argenteus. —Block Printing.—Marco Polo	30

CHAPTER III.

THE FLOWER-GARDEN.

Mimulus moschatus.—Centaurea moschata.—Muscaria pin- natifida.—Musk Rat.—Goat Moth.—Acanthus.—Cartha- mus tinctorius.—Rouge.—Crocus sativus.—Carlina acau- lis.—Onopordum acanthium.—Azalea pontica.—Geogra- phical Distribution of Bees.—Honey of Madagascar and of Narbonne.—Body of Alexander the Great.—Grafts.— Apples and Fish in Wax.—Leaf-cutting and Mason Bee. —Huber.—Insects on Compositæ.—Dahlia.—Arbutus.— Camellia.—Calmuc Tea.—Steppes of Asia	48
--	----

CHAPTER IV.

THE HOT-HOUSE.

Baubinia.—Ipomœa coccinea and quamolit.—Hibiscus rosa- sinensis.—Hibiscus esculentus.—Malvaceæ.—Cotton.—Il- licium floridanum and anisatum.—Anisette.—Maraschino. —Merises.—Mayduke — Bigarreau. — Kirschenwasser.— Walnuts.—Vanilla.—Violet Sherbet.—Bertola's Lines to the Violet.—Rose Apple.—Indian Rubber.—Banyan Tree. —Milton, Southey and Moore's Lines.—Dragon Tree of

CONTENTS.

v

	PAGE
Orotava.—Baobab.—Cocoa Nut.—Monkeys trained to fetch the Fruit.—Seychelles Island Cocoa Nut.—Albumen.—	
Orange Trees at Sorrento	64

CHAPTER V.

ON GLASS.

Fahrenheit and Réaumur.—Glass Fire Screen.—Ice Windows.—Glass of Pompeii.—Venetian Glass.—Glass Windows in England.—Discovery of Glass.—Sand.—Barons' Cave at Reigate.—Barilla.—Kelp.—Fuci, Uses of.—Fucus natans.—Wrack.—Fucus tenax.—Laminariæ.—Fucus crispus.—Dulse.—Laver.—Gelidium.—Chinese Swallow.—Soy.—Red Snow	85
---	----

CHAPTER VI.

ITALIAN MANUFACTURES.

Sparterie.—Leghorn Hats.—Mode of cultivating and preparing the Straw.—Manufactory of Benenden.—Pietra Dura.—Medici Chapel.—Roman Mosaic.—Roman Pearls.—Argentine.—Levitical Prohibition with regard to Fish.—Jews in Rome.—Ceremony of the Renewal of their Permission to remain in Rome.—Final Restoration of the Jews	99
---	----

CHAPTER VII.

ON SOUND.

Sound.—Bell in Exhausted Receiver.—Silence in Elevated Parts of the Globe.—Pistol on Mont Blanc.—Meteors.—Different Velocity of Sound in different Bodies.—Experiment of the cracked Glass and Champagne.—Sounds at	
---	--

	PAGE
Night.—Illustration of the Mirage.—Ice a Conductor of Sound.—Sea Fights.—Speaking Pipes.—Well at Carisbrook.—Cast-iron Pipes at Paris.—New Bell.—Echo at Girgenti.—Sound Conveyed by Water.—Along Wood, Wire, &c.—Ventriloquism.—Sensibility of the Human Ear.—Ear of Dionysius.—Statue of Memnon.—Musical Rocks.—Scientific Knowledge of the Ancient Priests	112

CHAPTER VIII.

ST. VINCENT DE PAUL.

St. Vincent de Paul.—Captivity at Tunis.—Tutor to Cardinal de Retz.—Changes Places with a Galley Slave.— <i>Sœurs de la Charité</i> .—President of the Council of Conscience.— <i>Salpêtrière</i> .—Sends supplies to Lorraine.— <i>Enfants Trouvés</i> .—His Death.—Foundation of the Orphan Asylum.—St. Vincent is canonized by the Pope	127
--	-----

CHAPTER IX.

THE SUGAR CANE.

Hard and Soft Water.—Sugar, History of.—Ideas respecting it.—Introduced into the Colonies.—Sugar Refining.—Alimentary Qualities.—Body Guard of the King of Cochin China.—Hindoo Tradition.—Species of Sugar Cane.—Manna.—Early Rising.—Anecdote of Frederick II.—Economy of Time.—Destruction of Books by a Beetle	138
--	-----

CHAPTER X.

THE GARDEN.

<i>Arundo Donax</i> , <i>Pragmites</i> , <i>arenaria</i> .—Law against Destroying the Bent.— <i>Calamus</i> .—Quill Pens.—Reed used by the
--

Turks.—Uses of the Reed.—Influence of the Choice of Food upon the Civilization of a People.—Rose of Jericho.—Cruciferae.—Colours in Flowers.—Night-scented Plants.—New Zealand Flax.— <i>Iris tenax</i> .— <i>Linnaea</i> .—Belladonna and Guernsey Lilies.—Mrs. Tighe's Lines.—Rose of Pæstum.—Otto of Roses.—Dog Rose.—Fruit eaten by Dogs, Foxes and Lizards.—Apple of Sodom.—Stock Seed.—Blood of St. Januarius	153
---	-----

CHAPTER XI.

ON LICHENS.

Lichens.—Oxalic Acid.—Tripe de Roche.—Iceland Moss.—Reindeer Moss.—Cudbear.—Perelle.—Orchill.—Litmus.—Cochineal.—Carmine, &c.—Tyrian Purple.—Murex and Buccinum.—Account of the Dye.—Fable of its Discovery.—Royal Colour.—Hyacinthine Curls.—Martagon Lily.—Mollusca.—Formation of Shells.— <i>Sepia</i> .—Indian Ink.—Polypus and Kraken.—Eight-armed Cuttle-fish.— <i>Nautilus</i> .— <i>Chama</i> .— <i>Pinna</i> and <i>Pinnophylax</i>	170
--	-----

CHAPTER XII.

THE FOOD OF VARIOUS NATIONS.

Earth eaten by the Ottomacœ, People of New Guinea, New Caledonia, Peru, Java, &c.—Steinbutter.—Girdle of Famine.—Ermine Hunters.—Gum Arabic.—Tartar's Curd.—Fish-Bread of Babylonians and South Americans. Food of Ants, Bees, Spiders, Locusts and Boas.—Bugong Moth.—Goat Moth.—Palm Worms.—Chinese.—Shark's Fins.— <i>Biche de Mer</i> .—Snails.—Escargatories.—Sir K. Digby.—Israelites.—Hybernation of the Snail.—Saw-Dust.—Shell of the Snail	189
---	-----

CHAPTER XIII.

PAGE

THE UPAS TREE.

Fabulous Account of the Upas.—Real History of the two Poisons known under that Name.—Bark Dresses.—Spathes of Palms.—Aristolochia.—Wourali and Curare Poisons of South America.—Wolf Poison of the Cape.—Fish Poison of Ireland.—Parysatis and Statira.—Mithridates.—Cornelia.—Marquise de Brinvilliers.—Iron Mask.—Magnetic Mask.—Pclisse - - - - - 202

CHAPTER XIV.

NATIONAL EMBLEMS.

Badges of the Scottish Clans.—Shamrock.—Irish Harp.—Royal Supporters.—Heraldic Visitations.—Distinction between Nobility and Gentility.—Commoner.—Horse, Saxon, Kentish, Hanoverian, Carthaginian, and Agrigentine.—Horse among the Ancient Germans.—Raven.—Sagittarius.—Plantagenets.—Fleur de Lys.—Lily and Rose.—Papal Present.—“Under the Rose.”—Rose of England.—Hawthorn.—Salamander, Natural History of - - - - - 218

CHAPTER XV.

THE GIPSIES.

Gipsies.—Hindoo Origin.—Major Kepple's Account of them. Rogers's Description.—Sortes Virgilianæ, Homericæ and Sanctorum.—Roman Number Six.—Nine of Diamonds.—Year 88.—Countess of Albany.—Last of the Stuarts.—Tomb in St. Peter's.—The Lady Arabella.—Queen Elizabeth.—Her Vanity and Love of Dress.—Anecdotes of her

CONTENTS.

ix

	PAGE
Court.—Learned Ladies.—Anne of Cleves.—Anglo-Saxon	
Needlework.—Spinsters.—Hypatia.—Vittoria Colonna.—	
Helen Cornaro Piscopia.—Novella d'Andrea.—Clotilda	
Tambroni.—Laura Bassi.—Agnesi.—English Female	
Science	235

CHAPTER XVI.

A MORNING WALK.

Politeness.—Silk Weed.—Peat Moss.—Sun Dew.—Mosses.	
—Tar, Pitch, &c.—Stone Pine.—Ravenna.—Wood of the	
Vine.—Duck's Nest in a Tree.—Robin's Cushion.—Gall	
Nut.—Mistletoe of the Druids.—Charcoal Burning.—De-	
ri- vation of Several Saxon Words.—On the Study of the	
Saxon Language.—Ferns, eatable.—Capillaire Plant.—	
Fern Seed.—Fungi, eatable.—Dry Rot.—Glow Worm.—	
Cleaning Instrument.—Claws of Birds.—Procrastination	253

CHAPTER XVII.

ON SHELLS.

Pearl Oyster.—English Pearls.—Age of Oyster.—Green	
Oyster.—Oysters of Lake Fusaro.—Pilgrim's Scallop.—	
Venus mercenaria.—Pholas.—Solen.—Tellina.—Cardium.	
—Cowrie, different Species.—Colouring Matter of Shells.	
—Helix Janthina.—Bulimus.—Periwinkle.—Strombus gi-	
gas.—Cameo.—Nautilus.—Porcellaneous and Mother-o'-	
Pearl Shells.—Temple of Serapis.—Teredo.—Sponge	
Fishery	273

CHAPTER XVIII.

THE WHALE FISHERY.

Portuguese Man of War.—Palate of the Whale.—Bill of the	
---	--

	PAGE
Duck.—Spermaceti.—Ambergris.—Whale Fishery.—Village of Smeerenberg.—Decline of the Whale Fishery	286

CHAPTER XIX.

VEGETABLE PHYSIOLOGY.

Watch of Flora.—Antipathies.—Smell of Flowers.—Flowers in a Room.—Leaves.—Necessity of Alternation of Light and Darkness to Plants.—Acidity of Fruits.—Starch.—Brazil Nuts.—Genipa.—Cannon-Ball Tree.—Calabash.—Inflammable Plants.—Fraxinella and Lycopodium.—Doodoe Nuts.—Stormy Petrel.—Guacharo.—Bog Fir and Oak. Paper from Peat.—Cæsalpinia pluviosa.—Coryanthes maculata.—Shagreen.—Fragrance of Flowers after Rain	299
--	-----

CHAPTER XX.

SEPULCHRES OF THE NATIONS OF ITALY.

Tombs at Pæstum.—Burning and Burying the Dead.—Hercules.—Roman Tombs.—Structure of the Sepulchres of Campania.—Cinerary Urns.—Contents of the Sepulchres.—Lachrymatories.—Toilet of the Roman Ladies.—Italo-Greek Vases.—Manner of Painting them.—Etruscan Vases.—Ancient Etruria.—Cities of the Etruscan League.—Tombs at Tarquinii.—Clusium.—Etruscan Scarabæi and Money	318
CONCLUSION	332

DESCRIPTION OF THE ENGRAVINGS.

ENGRAVING I.

Fig. 1. Machine for unrolling the papyrus MSS.

a a Screws for elevating or lowering the papyrus.

b Pasteboard cradle, in which the papyrus is laid.

c c c c Ribands which support the papyrus, and retain it firm in its position.

d d d Threads which are attached to the goldbeater's skin, and which support the unrolled portion of the papyrus. The other ends of *c* and *d* are fastened to a wooden frame, which encloses the whole machine.

e e e Deficiencies in the papyrus filled up with goldbeater's skin.

Fig. 2. Papyrus, showing the title *a* affixed to it.

Fig. 3. Papyri found tied up in a bundle.

Fig. 4. Papyrus in double rolls, (page 33.)

Fig. 5. Circular box, containing papyri rolled up and labelled.

ENGRAVING II.

Fac-simile of an unrolled papyrus, (page 34.)



Engraving I.

Fig. 1.

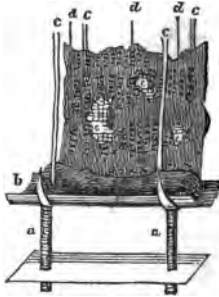


Fig. 2.

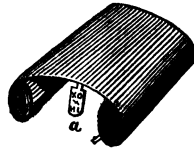


Fig. 3.



Fig. 4.



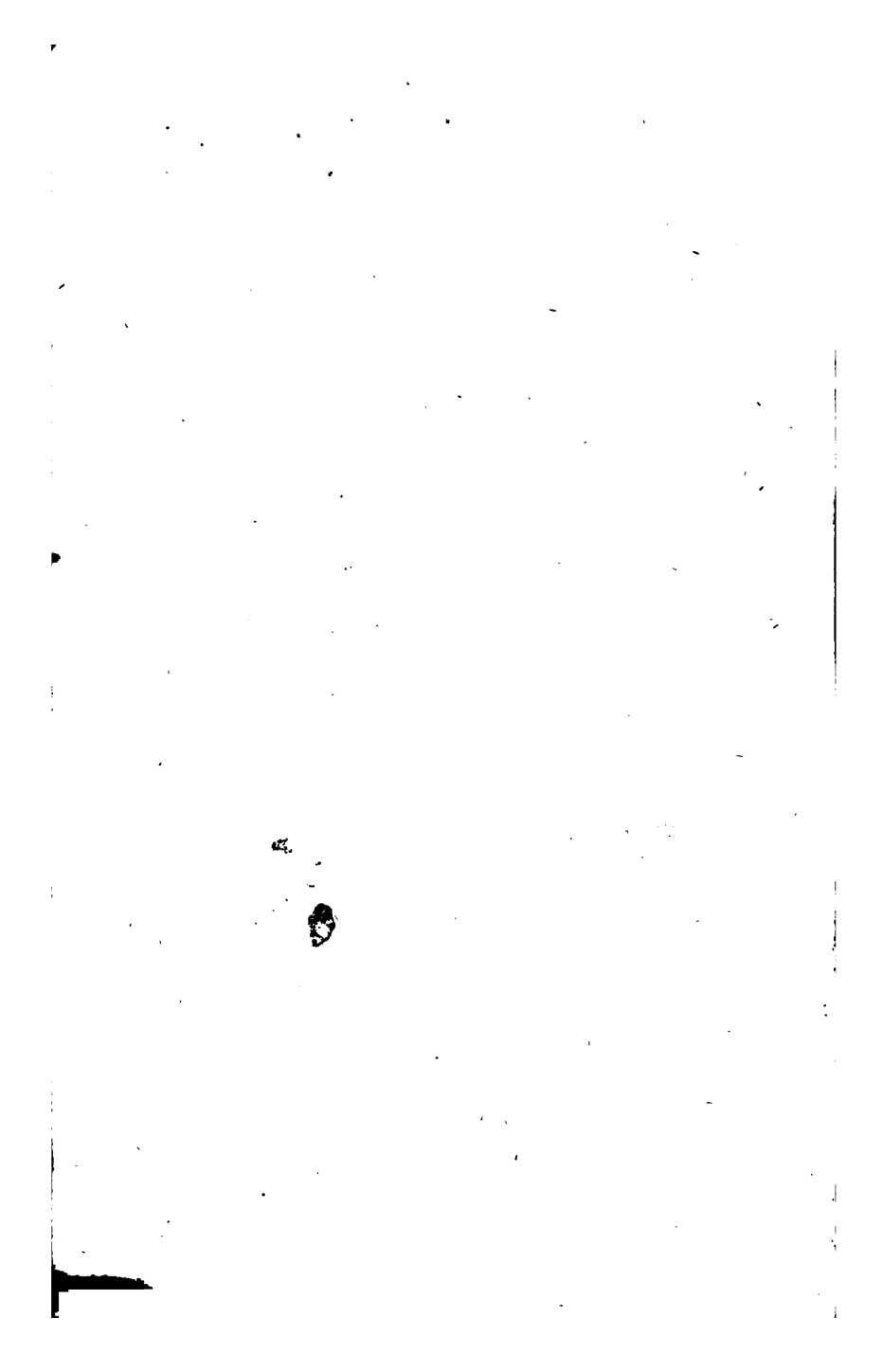
Fig. 5.





Engraving II.





CONVERSATIONS

ON

NATURE AND ART.

CHAPTER I.

PRINTING AND LIBRARIES.

INTRODUCTION. — ALDINI. — ITALICS. — OCTAVOS. — INK. — TYPOGRAPHICAL ACADEMY. — INSCRIPTION OVER THE LIBRARY OF ALDUS. — DOLPHIN. — PRICE OF BOOKS. — COSMOGRAPHY. — HIDE. — COUNTESS OF ANJOU. — BISHOP OF WINCHESTER. — LOUIS XI. — LIBRARIES OF JOHN AND CHARLES V. — IGNORANCE OF THE EARLY AGES. — COUNCIL OF NARBONNE. — LIBRARY OF PTOLEMY PHILADELPHUS. — DESTRUCTION OF BOOKS. — CROMWELL. — CONSTABLE BOURBON. — TAKING OF BUDA. — ALEXANDRIAN LIBRARY. — DISCOVERY OF MSS. — CALLIGRAPHERS. — SIR ROBERT COTTON. — MAIO. — PALIMPSESTS. — BOOKS THE TRIBUTE OF THE CONQUERED. — THE PANDECTS OF JUSTINIAN. — TREATY OF TOLENTINO. — HAROUN AL RASCHID. — CLEPSYDRA. — AL MAMOUN. — SIR WILLIAM JONES.

"Yet still the arts now dawning gleam'd
With hope of brightest day:
Printing the key to science seem'd,
A new and ready way."

FREDERICK and Henrietta Wilmot were the children of an officer in the army, whose wife had been ordered to pass a year at Madeira, as the only means of restoring her declining health. Being unwilling to interrupt the education of their

children, Mr. and Mrs. Wilmot determined upon leaving them at their respective schools; having confided the care of them, during the holidays, to Mrs. Fortescue, the widowed sister of Mr. Wilmot.

Idle, frivolous, and gay, Mr. and Mrs. Wilmot had bestowed little personal attention upon their children, but had considered that, in placing them at fashionable schools of high reputation, they had amply fulfilled their duties as parents, and had released themselves from all further necessity of watching the growth of their children's minds.

Frederick was now twelve years old, and, like most boys of his age, his acquirements were limited to a slight knowledge of Latin and Greek.

Henrietta was fifteen; she had been two years at school, and, being naturally quick and intelligent, had surpassed most of her companions in superficial attainments, and had acquired a degree of consequent importance among her school-fellows, which served but to increase her natural vanity and self-esteem.

Far different were her cousins Esther and Mary Fortescue, the first of the same age as Henrietta, the second about five years younger.

Bereft of her husband soon after the birth of Mary, Mrs. Fortescue had devoted her whole attention to the education of her daughters, and, fully impressed with the responsibility of instilling right principles into the minds of her children, she had taken the whole charge of their education upon herself, and placing it on the only solid foundation — religious principle, she had endeavored, under Divine assistance, to bring them up in a knowledge of the truth, "in the nurture and admonition of the Lord."

Both amply repaid the fostering care of their mother, and Mary already gave promise of that amiable disposition, that solid good sense, that uncompromising rectitude, which were more fully shining forth in her elder sister.

The midsummer holidays had arrived, when their cousins were to come from school. Esther was absent on a visit to her friend Mrs. Clifford, but was to return upon the follow-

ing day, so Mary only accompanied her mother to bring Henrietta and Frederick home.

Henrietta returned in high spirits, having gained the prize of her class, and impatiently awaited the arrival of the carrier with her trunk, that she might display her honors to her cousin. The trunk was brought in soon after the party had retired to rest, but was speedily unpacked, and its treasure triumphantly exhibited. The prize book was a copy of Thomson's Seasons, splendidly bound in red morocco. Mary examined it attentively, and having expressed her admiration of the beauty of its exterior, proceeded to examine the inside of the volume.

"Why, what is this, Henrietta?" said she; "this is called the Aldine* edition of the English poets, and here is a dolphin twisted round an anchor in the title page."

"I'm sure I can't tell you," replied Henrietta; "I should never have thought of asking such a question; what is the use of it? it can't be of much consequence."

"That I don't know," said Mary, but mamma has always desired me to ask the meaning of every thing which I don't understand."

"Oh, that would be very troublesome," returned Henrietta, "and, after all, what is the use of knowing? I have had the book a week, and have never thought it worth while to inquire."

"Well, but had you not better ask mamma?"

"No, indeed," said Henrietta, "for, perhaps, it may be something which I *ought* to know, and then she will find out my ignorance."

Here the conversation dropped, but Mary, though silent, was not satisfied, and the next morning she took the first opportunity of asking her mamma what was meant by the Aldine edition.

MRS. FORTESCUE.

I shall be most happy to tell you; but surely, as the book is your cousin's, you might have asked her.

* Pickering has published a neat edition of the British poets under this title.

MARY.

I did, mamma; but Henrietta could not tell me.

MRS. F.

Then, as she has been this morning in the library, she doubtless will have referred to the Biographical Dictionary, and be able now to give you all the information you require.

HENRIETTA.

No, indeed, I have not, aunt. I did not know where to find it.

MRS. F.

Then why did you not ask me?

Henrietta was silent.

FREDERICK.

Because, aunt, she does not like you to think her so ignorant as not to know.

MRS. F.

And, therefore, Henrietta, you are so proud as to prefer going without information rather than confess your ignorance. This is, indeed, my dear, a false shame, and a feeling which will prove the greatest bar to your improvement. Believe me, there is no disgrace in confessing your ignorance, but there is great disgrace in *remaining* in it, when the means of knowledge lie in your power. Recollect the answer of the ancient philosopher, who, when asked how he had acquired such a fund of knowledge, replied, "By inquiring every thing which I did not know, and leaving nothing unsearched until I had found it out." Follow his example, and you will be surprised at how much you will daily learn. Whenever you meet with any thing in the course of your reading which you do not comprehend, you should not proceed with your book until you have consulted works of reference, and gained the desired information.

HENRIETTA.

But how very tiresome this would be, aunt; we should never get through our books, and should take a week in reading what is now only a day's lesson.

MRS. F.

And, pray, of what consequence would that be? What is the object of all reading? Surely not to be able to *say* how many books we have read, but to store our minds with useful and solid information; and assuredly that object is better attained by a careful perusal of one book, than by reading a dozen in a hurried and superficial manner. Recollect, Henrietta, that it is the quantity of knowledge you acquire, not the quantity of books which you read, which is the object you should always have in view. Read to learn, not to boast, and you will become wiser and better from your knowledge: but I will say no more upon the subject, as I trust that what I have already observed may prove sufficient. Let us now proceed to Mary's original question, and tell her about the *Aldine* poets.

MARY.

Thank you, mamma.

MRS. F.

The edition so termed, is named after three celebrated Italian printers called the Aldini, father, son, and grandson, all distinguished by their talents and industry, and to whom we are indebted for great improvements in the art of printing. Aldus —

FREDERICK.

What a strange name!

MRS. F.

It was a corruption, or, rather, a diminutive of his baptismal name, *Theobaldus*. But, to continue; Aldus Pius Manutius was born in 1447, and set up a printing press at Venice, where, in 1494, he published his first work. The beauty of

his types was unrivalled, and he was the inventor of what was then called the Aldine, and has since been denominated the Roman or Cursive type.

HENRIETTA.

Is that the same as Italics?

MRS. F.

Precisely; and it is said that he founded his types in imitation of the handwriting of Petrarch, who was himself a most diligent collector and transcriber of ancient manuscripts. Aldus first employed them in his edition of Virgil in 1501, the first book which ever appeared in the octavo size.

HENRIETTA.

This alone must have been a great improvement.

MRS. F.

Yes, before that period, the unwieldy size of books prevented them from being portable, so that this invention of Aldus was of the greatest utility. The neatness of the text, the beauty of the ink, and of the paper of the first printers have never been surpassed.

MARY.

Where was their ink made, mamma?

MRS. F.

The Italian printers had theirs chiefly from Paris. This ink has a lustre and brilliancy which our modern ink does not possess; but whether this proceeds from a difference in the preparation, or from the influence of age, time alone can decide.* But it was the publication of the works of Aristotle which placed Manutius in the first rank among printers; and this alone, independent of all his other labors, would have entitled him to the gratitude of posterity; for it is impossible to form an adequate idea of the patience and sagacity it required to decipher the MSS. which served as bases to his editions, to supply omissions, and reconcile the various read-

* Valery, *Voyages en Italie*, t. iv. p. 411.

ings which presented themselves. Leo X was not insensible to his merit, but repaid it by publishing a bull in 1513,* by which he granted to Aldus, for fifteen years, the sole privilege of publishing whatever Greek and Latin books he had printed, or might afterwards print, as well as the exclusive use of the Italic type. Aldus was the intimate friend of the illustrious Picus of Mirandola,† and established a Typographical Academy, which reckoned among its members Erasmus, Cardinal Bembo, and many of the most distinguished persons of the age. This learned body used to assemble at the house of Manutius to examine the manuscripts, and to correct and decipher them. The inscription over the door of his room shows the zeal with which Aldus pursued his avocations. It was in Latin, but the translation is this: "Whoever thou art, Aldus begs and conjures thee, that if thou hast occasion to speak to him thou dost finish in a few words, and go away quickly; unless thou comest, like Hercules, to lend thy shoulder to the wearied Atlas. Then thou, and all that come here, will always find something to do."

FREDERICK.

What a curious inscription?

MRS. F.

Whimsical, like the style of the age; but it shows the ardor with which he prosecuted those researches to which he devoted his time and his fortune. In short, when we reflect that the exertions of Manutius rescued so many writings from their insecure existence in manuscript, and thereby extended their circulation — that he consequently changed the direction of studies from the narrow bounds of monkish legends to the noblest works of Greece and Rome — we must

* Roscoe's Leo X, c. xi.

† He died in his 32d year, two months after his friend and companion Poliziano, who expired the day on which Charles VIII entered Florence, 1494. Both were buried in the church of St. Mark, in that city.

consider him as having eminently contributed to the progress of civilisation and to the revival of learning, and must ever feel the deepest veneration for a man whose life was one continued series of labors which will extend their useful influence to the latest posterity.

HENRIETTA.

But, aunt, did you not say that there were three Aldini?

MRS. F.

Yes, Aldus was succeeded by his son Paul, who, as a printer and editor, equalled his father. Devoted to the study of Cicero, he published several editions of his works.* He was chosen professor of eloquence to the Venetian Academy, and remained in that city until 1561, when he removed to Rome, and set up his printing-press in the capitol. He died in 1574, leaving a son, generally called Aldus the younger, who had distinguished himself by his precocious talents, and was appointed by Clement VIII, to direct the presses of the Vatican. Aldus the younger died in 1597, leaving his affairs in the greatest disorder. The valuable library collected by his father and grandfather (and which he had wished to leave to the republic of Venice) was dispersed among his creditors, and the press of Aldus ceased to exist, after having flourished for nearly a century.†

HENRIETTA.

Thank you, aunt, for this very interesting account, which my foolish false shame nearly made me lose hearing. But now you have not told us the meaning of the dolphin twisted round an anchor, which I see in the title-page of my book.

MRS. F.

That was the distinguishing mark of the Aldine press; for,

* The number of copies taken off at one edition in those times was very small: so that certain works of Cicero, published by Paul Manutius, were reprinted almost annually.

† See Roscoe's *Leo X.*, and *Biographie Universelle*, for detailed lives of the Aldini.

at that time, all the printers used peculiar signs, by which the works of their press might immediately be recognised.

HENRIETTA.

How very much we read that books were prized formerly.

MRS. F.

Yes, so long as they remained in manuscript their cost was very great. In 690, Aldfred, King of Northumberland, gave an estate of eight hides of land for a work upon cosmography.

MARY.

Oh, pray stop, mamma, and tell me the meaning of that word.

FREDERICK.

Its derivation, Mary, is from two Greek words, *kosmos*, the world, and *grapho*, to write.

MRS. F.

Therefore, *cosmography* is a treatise on the general system of the universe—its construction, its form, and the relation of each part to the whole. Cosmography divides itself into two branches; astronomy, which treats of the heavenly bodies, and geography, which has for its object the description of the earth.*

HENRIETTA.

Thank you, aunt, for the explanation. I never rightly understood the difference.

MARY.

But what is a hide?

HENRIETTA.

A hundred acres.

* Guizot, Dictionnaire des Synonymes.

MRS. F.

A Countess of Anjou, in the 15th century, paid for one book 200 sheep, 5 quarters of wheat, and the same quantity of rye and millet;* and in early times the loan of a book was considered to be an affair of such importance, that, in 1299, the Bishop of Winchester, on borrowing a Bible from a convent in that city, was obliged to give a bond for its restoration, drawn up in the most solemn manner; and Louis XI (in 1471) was compelled to deposit a large quantity of plate, and to get some of his nobles to join with him in a bond, under a high penalty to restore it, before he could procure the loan of a book which he borrowed from the faculty of medicine at Paris.

HENRIETTA.

How very few books people had then. I read the other day, in a description of Paris, that King John (of France) had only eight or ten volumes in the royal library, and that Charles V increased their number to 110.

MARY.

And I have read, too, that, in 855, there was not a copy of Cicero in France.

MRS. F.

Very likely; but then we must also take into consideration the ignorance of those times, when learning was almost entirely confined to the clergy, and, even among them, so much ignorance existed, that by an ordinance of the Council of Narbonne, held in 589, they were obliged to forbid that any one should be received into the ecclesiastical state who

* The sums given in modern times have been proportionably great. In 1812, the Marquis of Blandford gave 2260*l.* sterling for an edition of Boccaccio, (Venice, 1471,) which has since passed into the library of Lord Spencer. So Pope says,

“ In books, not authors, curious is my lord;
To all their dated backs he turns you round:
These Aldus printed,” &c.

could not *at least read*; and, in the time of Alfred, there were few priests, south of the Humber, who could translate the Latin service;* indeed, had not divine service been continued to be performed in Latin, the language would probably have been forgotten, and the works of the ancients have been irrecoverably lost to posterity.† Kings and other great men at that time could only make their mark; Charlemagne was unable to sign his own name, and never made any progress in literature until the age of forty-five.

FREDERICK.

But how was it, aunt, that books had become so scarce, for the ancients had very large libraries? In the Philadelphian, at Alexandria, for instance, there were said to be 700,000 volumes.

MRS. F. ●

Because, in the various wars which have devastated the earth, conquerors have not been content with destroying the vanquished, but have extended their vengeance even to their books. The Romans, Jews, and Christians, mutually burnt the books of each other, the Spaniards those of the Moors, the Puritans those of the papists, and even Cromwell, in his fanatic zeal, set fire to the library at Oxford, one of the most curious in Europe. The Florentines burnt the books of the Medici; and the sack of Rome, by the Constable Bourbon, was fatal to the treasures of the Vatican. The same year‡ the Turks destroyed the beautiful library at Buda of Mathias Corvinus, who had collected 50,000 volumes. The library of the Electors was part of the spoils of the Palatinate, but fortunately, instead of being burnt, it was transferred by Maximilian of Bavaria to the Vatican.

HENRIETTA.

And then there is the burning of the Alexandrian library, by the Caliph Omar.§

* "In Wessex, Alfred says, there was not one."

† Schmidt, *Histoire des Allemands*, vol. i. p. 329.

‡ A. D. 1527.

§ A. D. 640.

MRS. F.

Yes, as the story is told, 4000 baths of the city were heated for six months with this precious fuel; but the fact has always remained a subject of much doubt.

FREDERICK.

Why?

MRS. F.

On account of the silence of two early Christian authors, one of whom* describes the taking of Alexandria, and could hardly have suffered so important a circumstance to pass unnoticed.† The first mention of the fact is by Abulpharagius, an historian who wrote 600 years after the event; but, on the whole, I should say that modern historians are generally disposed to admit the act, which seems, however, so contrary to the general character of either Omar or Amrou, that we must look upon it as an action demanded by the barbarous superstition of their age, rather than to any wish or impulse of their own.

HENRIETTA.

When was it that the learned began to occupy themselves in the recovery of books?

MRS. F.

In the 15th century, and monasteries were then diligently searched for manuscripts. The Pandects of Justinian were discovered at Amalfi, Tacitus in a convent at Westphalia, and Petrarch was the fortunate discoverer of a portion of Cicero's Letters in the library of the chapter of Verona.

HENRIETTA.

I should like to see the MS. discovered by Petrarch.

MRS. F.

It is in the Laurentian library at Florence, as well as the

* Eutychius.

† Gibbon's Decline and Fall, chap. li.

poet's copy of this and several others of Cicero's works,* for Petrarch transcribed many manuscripts, and we have before alluded to the beauty of his handwriting; but among the emperors, Theodosius the younger was so celebrated for the elegance with which he transcribed religious works as to acquire the epithet of *Calligraphes*, or fair writer.† Many manuscripts have been recovered in the most singular manner. Part of Livy, for instance, was found by a man of letters on his battledore, and Sir Robert Cotton discovered his tailor on the point of cutting up for measures the original Magna Charta; but we have reason to believe that many valuable works of the ancients have been lost from the monks having erased the writings, in order to inscribe their own legends on the parchment, the value of the material being at that time so great as to compensate them for the labor. The celebrated Maio has discovered, by the assistance of chemistry, a liquid with which he washes the parchment, which restores the original characters, and thus many valuable fragments of the ancient classical writers have been restored, interlined with monkish legends.

HENRIETTA.

Did you ever see any, aunt?

MRS. F.

Yes, I saw one in the Ambrosian library at Milan, where there are several. The Orations of Cicero, over which had been transcribed the poems of a priest of the 6th century; other portions of the same author, under a Latin translation of the acts of the Council of Chalcedon; the letters of Marcus Aurelius, under another history of the same council; and the Institutes of Gaius,‡ which were not only covered with a treatise of St. Jerome, but had also a *third* writing between them, which likewise consisted of epistles and meditations

* Valery, *Voyages en Italie*, iii. 41.

† Gibbon, chap. xxxii.

‡ A celebrated Roman writer upon Jurisprudence.

of the same saint, so that the writing had been erased twice from the parchment.*

FREDERICK.

Are these the writings which I have heard called palimpsests?

MRS. F.

Yes, the term is derived from the Greek *palin*, again, and *psao*, scrape.

FREDERICK.

Aunt, since you were telling us of the value of manuscripts, I have just recollected that Ptolemy Physcon, at the time of the famine, refused to furnish the Athenians with corn, unless they gave him the original copies of Sophocles, Æschylus, and Euripides.

MRS. F.

Well remembered, Frederick. Books have often been the price of conquest, particularly in Italy. A copy of Cæsar's Commentaries was the spoils of a victory of the Genoese fleet over the king of Arragon, in 1435. The Pandects of Justinian were the price of the surrender of Pisa; and, even in modern times, the cession of 500 MSS. of the Vatican was one of the articles of the treaty at Tolentino.

FREDERICK.

I beg your pardon for interrupting you, aunt, but where are the Pandects now?

MRS. F.

At Florence: their history is singular. Discovered at Amalfi, they were taken at the siege of that city in 1135, by the Pisans. Many think it was a copy sent into Italy by Justinian himself: be that as it may, it is the oldest in existence. Gino Capponi having forced Pisa to surrender by

* Valery, *Voyages en Italie*, t. i. p. 302. This last palimpsest is at Verona.

famine, carried away the Pandects as the terms of capitulation, and took them to Florence,* when they were placed in the *Palazzo vecchio*, and only shown, in the time of the republic, by special permission of the seignior, and by torch-light. They were afterwards removed to the Laurentian library, and the key kept by one of the officers of the court. They are still there; one volume is locked up, the other is placed open in a glass case.† But I have one more instance which occurs to me, of the desire of acquiring books, in the celebrated Al Mamoun, son of Haroun al Raschid, who, when he defeated the Greek emperor, Michael the Stammerer, required that he should give him a certain number of Greek books as a tribute.

FREDERICK.

Was it not Haroun al Raschid who sent a clock to Charlemagne?

MRS. F.

Yes; the first that had ever been seen in Europe; but it was not a clock such as we use now, but a water clock, or *clepsydra*, so called from the Greek, *klepto* to steal, and *udor* water the time being measured by the escape or stealing of water through a hole in the bottom of the vessel. Haroun al Raschid himself was a great patron of literature, and he never went a journey without being accompanied by at least a hundred men of learning. But it is his son, Al Mamoun,‡ who may be regarded as the father of science among the Arabians. He invited the learned of all countries to his court, he exhausted his treasures in collecting manuscripts, in patronising astronomy, and in promoting the interests of science, and the reign of Al Mamoun may be looked upon as giving the same impulse to the eastern nations, as the age Augustus, or Leo, exerted over the western. In the midst of ignorance and superstition Al Mamoun shines pre-eminent,

* A. D. 1406.

† Valery, *Voyages en Italie*, t. iii. p. 38.

‡ Succeeded his brother, A. D. 813.

and sheds a ray of lustre over the dark ages in which he lived;* but we must leave off talking, for the morning is nearly gone, and we have not begun our studies.

HENRIETTA.

Oh, aunt, I am so sorry! for I had a great many questions to ask you. I wished you to tell me what made parchment so scarce as to induce the monks to use the old manuscript.

MRS. F.

It had never been plentiful; for the elaborate preparation it required had always made it a costly article, and it was only manufactured at one place.

HENRIETTA.

But did they not make paper of papyrus?

MRS. F.

Yes, papyrus paper was known, but it had become scarce since the conquest of Egypt by the Saracens;—but I shall be happy to continue the subject another day; and now we must leave off, for we have done nothing this morning.

HENRIETTA.

Do you call this *nothing*, aunt? I am sure that I have learned more than in a week's common reading.

MRS. F.

More general information, no doubt, if you read in the superficial manner which you describe; but, improving as these conversations may be, they can never stand in the place of regular study. Reading and conversation should be combined. "Read and Learn," said his mother to Sir William Jones; and though I am far from giving you that answer to your inquiries after information, yet, believe me, that all the desultory conversations we may hold, can never compensate for that regular, systematic course of study, which alone

* Sismondi, *Litterature du Midi de l'Europe*, t. i. p. 45.

can constitute a good education;—but I hear a ring at the bell—that must be Esther.

All ran out to meet her, for Esther was welcomed with pleasure wherever she went. Her kindness and consideration had made her as great a favorite among the younger branches of the family, as her sensible, well-regulated mind had endeared her to her mother. She had passed a most agreeable visit with her friend, Mrs. Clifford, who lived in the neighborhood of Guildford, and had obtained permission to show her beautiful garden to her sisters and cousins; for, disinterested and generous by nature, Esther enjoyed nothing alone, and felt no indulgence a source of gratification to herself, unless it could be shared by those she loved.

CHAPTER II.

PAPYRUS MANUSCRIPTS.

PAPYRI OF HERCULANEUM—THEIR DISCOVERY—METHOD OF UNROLLING THEM—ONLY WRITTEN UPON ONE SIDE—TITLES, WHERE PLACED.—PRESENT STATE OF THE 1756 MSS.—PAPYRUS PAPER—HOW MADE.—PAPYRUS AT SYRACUSE.—CHEVALIER LANDOLINA.—LAWS SET TO MUSIC.—TEUTONIC PARAPHRASE OF THE BIBLE.—CÆDMON.—ARUNDELIAN MARBLES.—WILLS OF THE ROMAN SOLDIERS.—WOOD.—BONE MEMORANDA.—WAX.—HOUSEHOLD BOOK OF PHILIP LE BEL.—TALIPOT TREE.—BARK BOOKS.—INDIAN PAPER.—LINEN CLOTH.—SKINS.—GOLD MSS.—GRADUAL OF ST. GREGORY.—PARCHMENT.—PURPLE VELLUM.—SILK PAPER—COTTON—LINEN.—CODEX ARGENTEUS.—BLOCK PRINTING.—MARCO POLO.

*"Papyrus, verdant on the banks of Nile,
 Spread its thin leaf, and waved its silvery style;
 Its plastic pellicles Invention took,
 To form the polish'd page, and letter'd book,
 And on its folds, with skill consummate taught
 To paint in mystic colors sound and thought."*



Pompeii.

THE following afternoon the conversation was resumed.

MRS. F.

In order that I may be able to give you a more detailed account of the various modes and materials employed for transmitting knowledge before the discovery of printing, I have brought down some notes which I made upon the subject many years since: but, before we leave the subject of Manuscripts, I must tell you something of the papyri discovered at Herculaneum.

HENRIETTA.

Thank you, aunt; I should so much like to know all about the Herculaneum and Pompeii MSS.



Herculaneum.

MRS. F.

Not Pompeii, Henrietta, for those which were found in that city fall into powder as soon as touched. Those of Herculaneum alone are in a state to be unrolled, and the difficulty and delicacy of the undertaking render it a most laborious and ingenious operation.

ESTHER.

Where were these papyri found?

MRS. F.

In prosecuting the excavations at Herculaneum, the workmen came, in 1753, to a small room which had presses all round it, and one in the centre, containing books on both sides, but the wood of the press was so completely carbonised that it fell into pieces when touched.

ESTHER.

How did they know they were books?

MRS. F.

The order in which they were found, carefully arranged one over the other, was the only circumstance which excited attention, and convinced the workmen that they could not be wood or cinders. Upon closer examination characters were discovered upon them, which the learned immediately occupied themselves in endeavoring to decipher.

HENRIETTA.

Were there none in any other parts of the city?

MRS. F.

Probably there may have been many lost to us, but as they were in a mass with rubbish, lava, &c. they could not be recognised; for you must recollect that the excavations of Herculaneum are about 100 palmi* under ground: indeed the accumulated mass of lava and ashes has buried the city at depths from 70 to 112 feet, and so completely filled up the town, that all the work is carried on with pickaxes. It is to this room (which was in a country house) not being entirely choked up, that we owe the fortunate circumstance of their preservation. A few more were found in the portico of the same house, preserved in little portable boxes, and some others in another room in the same habitation; making together 1756 manuscripts, all written upon papyrus. Various were the means employed to unroll them: some were cut into two longitudinally, by which a small portion of the characters was rendered visible: in short, they were subjected to all kinds of attempts, until Father Piaggio discovered the present manner of unrolling them.

HENRIETTA.

What is it?

* The Neapolitan palm is rather more than ten English inches.

MRS. F.

The papyrus is laid upon cotton, supported by a piece of pasteboard, which lies upon two semicircular pieces of metal. The workman begins by glueing small pieces of goldbeater's skin upon the back of the papyrus until the whole of the exterior of the roll is covered. He then attaches three threads to the end of the goldbeater's skin, and suspending them to the top of the frame, proceeds, with the point of a needle, to detach from the roll two or three lines of the end of the papyrus, which has been made of a tolerable consistency by the addition of the goldbeater's skin. As soon as these lines are unrolled, the same operation of applying the goldbeater's skin is repeated, until, by the greatest patience and diligence, the whole MS. is gradually unrolled. Here is a little sketch of the machine (which is placed in a kind of frame), which will perhaps better enable you to understand the process. (*Fig 1.*)

HENRIETTA.

But then, aunt, they can only read one side of the page.

MRS. F.

Fortunately, the Manuscripts are generally only written upon one side of the papyrus, otherwise the operation would be impossible. There is, however, one papyrus which is written on both sides. It would appear to be an original MS.; and the author having filled the end of his volume before he had arrived at the conclusion of his subject, has written three pages on the other side of the papyrus. I also saw, in the Ambrosian library at Milan, a Josephus in papyrus, which is said to be of the fourth century, and is also written upon both sides of the paper.

ESTHER.

How did the ancients arrange their books; because it must have been very difficult to distinguish one from another, among so many rolls?

MRS. F.

Those found in the kind of press or bookcase which I have

described, were arranged horizontally along the shelves. Their titles were either written on the end of the papyrus* or upon a piece of papyrus paper fastened to the middle of the papyrus, in this way (*Fig. 2*). Some papyri were found tied up in bundles (*Fig. 3.*); others in double rolls, as if the last reader had left them open where he left off reading (*Fig. 4.*); and some in a box, as I have before mentioned, that they might be carried about in safety (*Fig. 5*). From the blank paper which is often found round the papyri, it would appear that each volume had a sheet of blank paper rolled round it, in order to protect the fragile material of which it was composed. The marks of the lines ruled for the guide of the copyist are still visible; and the ancients appear to have had their *large paper* copies of their works, as well as the moderns. The size of the Greek MSS. is generally smaller than the Latin; the former being from 8 to 12 inches, the latter from twelve to sixteen, broad. Some are 110 pages long, others upwards of 62 feet (75 palmi) by measurement. This is an engraving shaded so as to give an idea of the state of the MSS. when unrolled (*Engraving II*).

HENRIETTA.

What a ragged, torn looking thing.

MRS. F.

True; but when you take into consideration the difficulty of the task, it is wonderful that the unrolling is ever effected at all. If the glue be put on in too large quantities, it will probably remove a portion of the next layer of the papyrus; a breath of air will carry away all these pulverized particles, and dust is so fatal, that one Manuscript having become covered with dust, it took a whole year to remove it.

* Whether the title was also written, as some suppose, at the beginning, cannot be discovered from the papyri of Herculaneum, none of them being in a sufficient state of preservation to decide the point.

ESTHER.

Then, what is done with those that are unrolled to prevent such an accident.

MRS. F.

They are put into frames with glasses over them, and are eventually hung up in the Museum. One has been left in its whole length in order to give an idea of the original form and extent of the MSS.; but this system has not been followed, it being found more convenient for the draughtsmen and interpreters, to divide the papyrus into several fragments, as they require to turn the page in different lights in order the better to decipher the characters. The manuscript is first passed to the draughtsman, who copies the characters with the greatest exactness, so as to render it a complete facsimile of the original; his copy is then submitted to the inspection of the interpreters, who having approved of it, pass it to the engraver; he, having engraved it, returns it to the interpreters, who then publish it in their learned and elaborate work. Here is a little specimen, which, although you do not understand Greek, will show you the method of proceeding.

HENRIETTA.

How many manuscripts are unrolled?

MRS. F.

Of the 1756 papyri found at Herculaneum, 210 have been entirely and usefully unrolled;* 127 have been partly opened; but the work has been suspended from finding them illegible; and 205 could not be unrolled because they were not sufficiently compact to bear the application of the goldbeater's skin; 27 have been presented by the government to England and France; 23 have been used for the purposes of experiment; and 1164 remain untouched: so they may yet contain much that is valuable and interesting.†

* This is the report of 1835.

† See *Officina de' Papiri descritta dal Canonico de Jorio*.

FREDERICK.

What are the subjects of those which have been unrolled?

MRS. F.

This library was found in what appears to have been the country house of an Epicurean philosopher, and the works which have been as yet deciphered are naturally those of his school: *all*, I believe, are writings which were before unknown to the moderns; and when we reflect upon the number yet to be unrolled, we may hope that great riches are still concealed in this unique collection. Whatever may be, however, the intrinsic value of the writings already published, they may yet serve to elucidate others of greater interest; and therefore, the plan which the academy adopt, of publishing every fragment which they unroll, is the most prudent, the most useful, and the most likely to lead to beneficial results.

ESTHER.

Where was papyrus paper first manufactured, mamma?

MRS. F.

That is unknown; but there existed manufactories of it at Memphis 300 years before the reign of Alexander. Afterwards, and at the time of the conquest of Egypt by the Romans, it was chiefly made at Alexandria. Till this conquest, however, the paper was of an inferior quality, but the Roman artists paid great attention to its improvement; and it was exported in large quantities from Egypt. The possession of that country by the Saracens interrupted and diminished the export, and few manuscripts on papyrus are of a later date than the eighth or ninth century.

ESTHER.

Of what part of the plant was it made?

MRS. F.

The learned differ upon this point; but I believe the most received opinion is, that it was made from the stalk (the

upper and lower extremities of which were rejected*), which was divided longitudinally into small thin plates. These were placed side by side, and then others put across them to strengthen and unite them. The whole was dried with a woollen cloth, and, after some other preparations, rendered fit for writing upon.† The papyrus is still found in the river Anapus near Syracuse, where it was probably transported by Hiero‡ (or some of the other tyrants of Syracuse) from Egypt.§



Papyrus.

ESTHER.

How I should like to see it growing!

MRS. F.

The Syracusan farmers used to cut it to bind up their sheaves of corn; but this custom is now prohibited; and the

* This portion of the stalk served to make an inferior description of paper.

† De Jorio.

‡ Denon.

§ According to Pliny the roots of the papyrus served for fuel, and the bark was converted into sails, mats, and ropes; its juice was applied to medicinal purposes; the farina of the flower afforded the strongest gluten; its stalk was twisted into canoes and boats; and indeed, it is in a basket of papyrus that Moses is supposed to have been exposed upon the Nile.

graceful papyrus, bending its tufted head over the clear waters of the river, presents a most elegant study to the artist. An attempt at reviving the papyrus paper has been made, by the Chevalier Landolina* of Syracuse; but as the best papyrus paper could only prove a poor substitute for linen paper, the attempt is a mere object of antiquarian curiosity. But I think that we must now dismiss the subject of papyrus, and proceed to the other various materials and methods employed for transmitting knowledge.

FREDERICK.

Thank you, aunt.

MRS. F.

In the earliest ages of society, the simple laws which were then sufficient for a community were, among the Greeks, set to music and chanted or sung.† This mode of conveying instruction was continued to a later period, and was so customary among the Teutonic nations, that paraphrases of the Bible were not unfrequently made in verse; the achievements of their ancestors were celebrated in song, and, as I before said, the Scriptures themselves were turned into rhyme.

ESTHER.

There is a very interesting account of Cædmon, the great Saxon versifier of the Bible, in Sir Francis Palgrave's entertaining History of England. I will read it to you this evening.

MRS. F.

The next step in transmitting knowledge was the engraving of their laws, by the Greeks and Romans, upon tables of wood, ivory, brass, or stone.

ESTHER.

I have often heard of the Arundelian Marbles being referred to for dates; pray, mamma, what are they?

* Hughes's Travels, vol. i. p. 90.

† See Sir Francis Palgrave's Anglo-Saxon History, and the life of Caxton, in the Library of Useful Knowledge, from which the following account is principally taken.

MRS. F.

The Arundelian consist of a series of sculptured marbles, collected in Greece at the expense of Thomas Howard, who was Earl of Arundel in the reigns of James and Charles the First. They comprise statues and gems as well as inscriptions. The latter are those to which you allude, and which are the objects of our present attention. They were inserted into the walls of the garden at the back of Arundel House in the Strand, and were examined by Seldon, who deciphered and published several of the inscriptions in 1628. During the civil wars, the Arundel family being obliged to leave their mansion, the parliament put it under sequestration, and suffered the marbles to be plundered and defaced. It is even asserted that part of the Parian Chronicle was worked up in repairing a chimney; and it is supposed that not more than half of these valuable inscriptions escaped destruction. Those that were preserved were presented to the University of Oxford, where they still remain.

HENRIETTA.

What is the nature of the inscriptions?

MRS. F.

Principally records of treaties, public contracts, public thanks of the state to individuals, &c.; but the most curious inscription is that to which I have just alluded—the Parian Chronicle—which gives a chronological account of the principal events in Grecian (particularly in Athenian) history, from the time of Cecrops* to the year B. C. 264; a period of 1318 years.† But to return to engraving upon metals.

FREDERICK.

Aunt, I can give you an instance: the Roman soldiers were allowed, on the field of battle, to write their wills upon their bucklers or scabbards.

* B. C. 1582.

† Elme's Dictionary of the Fine Arts.

MRS. F.

Well recollected, Frederick. I am glad to see that you can apply your reading; but we must not wander from our history of writing. Brass, lead, and copper were used for inscriptions, but wood was most generally employed, both for public as well as for private purposes. In the fourth century, the laws of the empire were inscribed upon wooden tables.

ESTHER.

Did not the ancients write upon bone or ivory?

MRS. F.

Yes. Among the relics in the Museum at Naples, is a number of small oblong sheets of bone, fastened at their extremity by a piece of metal, which runs through a hole perforated through each, just like those which are used by us for memoranda. The ancients wrote upon these tablets with pencils of *minium*, or red lead, which is rubbed out as easily as our black lead; so you see that even this little contrivance is not a modern invention.*

FREDERICK.

But did not the Romans cover their tablets with wax?

MRS. F.

Yes. With their manner of writing upon them, with a metal or ivory style, you are no doubt well acquainted; but these waxen tablets were employed till a very late period. At Geneva, I saw in the library a fragment of the account of the household expenses of Philip the Fair,† written upon waxen tablets with a style. The MS. is almost illegible now, but was deciphered before it became in such bad order.‡

ESTHER.

Shakspeare alludes to the table books in Henry the Fourth,§ when the Archbishop of York says,

* De Jorio.

† For part of the year 1303.

‡ Valery, vol. i. p. 18.

§ Part ii. act. iv. sc. 1.

"And therefore will he wipe his tables clean,
And keep no tell-tale to his memory;"

and Hamlet also, after his interview with his father's ghost, says,*

"My tables -- meet it is I set it down."

MRS. F.

We also read that Lady Jane Grey gave her tables to Sir John Gage, the Constable of the Tower, before her execution; but, we must now proceed to writing or engraving upon wood.

ESTHER.

The Scandinavian nations appear always to have employed wood, before their communications with the Latin Missionaries; and Sir F. Palgrave says that our verb *to write*, is derived from a Teutonic root, signifying to scratch or tear,† and is one of the testimonies of this usage. The Cymri adopted the same plan. Their poems were graven upon small stems or rods, one line upon each face of the rod; and the old English word, *stave*, as applied to a stanza, is probably a relic of the practice which, in early ages, prevailed in the West. In the East, you will find the same custom still subsisting. The slips of bamboo, upon which the inhabitants of the Indian Archipelago now *write* or *scratch* their compositions with a bodkin, are substantially the same with our ancient staves."‡

HENRIETTA.

What kind of wood was used?

MRS. F.

The ancients employed box and citron wood, but beech was principally used in the middle ages.

ESTHER.

Were not leaves also used?

* Act i. sc. v.

† *Ritzen* or *reissen*.

‡ Anglo-Saxon History, p. 153.

MRS. F.

Yes; and even in the present day, several of the eastern nations employ the leaves of the Talipot-tree.*

Hence the word *folio*, from *folium* a leaf, and the meaning of *leaf* when applied to books. But this mode of writing seems to have been superseded by the use of the inner bark of trees, of the lime particularly. This bark the Romans called *liber*; hence the Latin word for a book, and the English words derived from it, *library*, &c. Our Saxon ancestors commonly employed the bark of the beech tree, called *boc*, in their language, whence our word *book* owes its origin. A library of bark books has recently been discovered among the Calmucs; the Birmans still use bark for their writings; and the *Indian paper*, employed by engravers for their fine engravings, is also made of bark. It is imported from China; its beauty consists in the paleness of its color, and the texture is so delicate that it is never pasted; the mere blow given in stamping the copper-plate upon it being sufficient to attach it to the paper upon which it is laid.

ESTHER.

Linen cloth, upon which the letters were painted, was used by the Egyptians; and I recollect seeing a large roll of it which had been taken out of a mummy in the Museum you took us to see.

MRS. F.

Yes; and the same material was also employed by the Romans: but skins of animals were, according to Herodotus, first adapted to the purposes of writing by the Ionians, who could only procure papyrus at a great expense; those of sheep, goats, and asses were preferred; and the Persians also employed the same material. Leather or skins, prepared in the modern manner, were often used by the Jews, on which to write the Scriptures; and the poems of Homer were once written upon the intestines of a serpent, in letters of gold, and the MS. was 120 feet long.

* *Corypha umbraculifera*.

HENRIETTA.

Is this still to be seen, aunt?

MRS. F.

No: it was deposited in the Philadelphian Library, and afterwards taken to Constantinople, where it was destroyed by fire in the sixth century.

HENRIETTA.

Did they often write in gold letters?

MRS. F.

Yes, many MSS. so written are scattered in the various libraries of Europe. There is a Gospel in the Laurentian Library at Florence in letters of gold,* and at Monza, I saw a most interesting manuscript—the *Gradual* (or choir book) given by St. Gregory to the Cathedral of Monza. It is of purple leather, and the letters are in gold and silver. In this collection, is also a precious papyrus inventory of the relics presented by that great pope to Queen Theolinda, the founder of the cathedral.

ESTHER.

I think, mamma, that parchment and paper are the only two materials which you have not alluded to.

MRS. F.

Papyrus paper was used before parchment was known; the invention of the latter being attributed to a quarrel between Eumenes, King of Pergamus,† and the King of Egypt, in consequence of which the latter prohibited the exportation of papyrus, and Eumenes invented parchment as a substitute. But this story is now considered to be destitute of foundation, for parchment is mentioned as having been known long before the age of the Ptolemies, and it is therefore probable that Eumenes only improved its manufacture.

* Valery, vol. iii. p. 48. St. Boniface brought from England into Germany the Epistles of St. Peter written in letters of gold.

† The second of that name—died B. C. 159.

FREDERICK.

Then comes vellum, I suppose, aunt.

MRS. F.

It only being a finer kind of parchment, prepared from the skins of very young calves, I need not allude to it separately, except to tell you that MSS. exist of purple vellum.† Paper now is the only material which we have not enumerated. Its earliest fabrication was, as you all know, of papyrus.

ESTHER.

From which comes our word *paper*.

MRS. F.

Papyrus paper we have already fully discussed. Silk paper has been made from the earliest times, by the Chinese, who, about the year A. D. 649, introduced the manufactory to Samarcand; and, when this city was conquer'd by the Saracens, an Arabian learned the art, and, employing cotton instead of silk, made his paper at Mecca A. D. 706.‡ From that city the manufacture spread over all the Saracen dominions, and was particularly carried on in Spain, where, in the twelfth century, the town of Sativa, (now San Philipppo) in Valencia, was celebrated for its paper, the manufacturers having substituted flax, which grew in abundance, to cotton, which was scarce and dear. Alphonso of Castile established a manufactory in the Christian states of Spain, whence it passed in the 14th century into Italy; and linen paper, such as we now employ, became of general use.‡ I have now given you a tolerably connected account of paper and its substitutes. With the history of printing you probably are already acquainted, and I therefore leave the subject, only observing, 'that the most remarkable point in the history of this art,

* There is a manuscript of the Gospels of the sixth or seventh century at Brescia, which is one of the most ancient in purple vellum.—*Valery*, vol. i. p. 249.

† The Arabian MSS. are generally on silk paper.

‡ Sismondi, *Lit. du Mid. de l'Europe*, vol. i. p. 72.

which has been destined to change the moral aspect of the globe, is not its so called discovery by Guttemberg or Koster, but the great length of time which elapsed before it was put into use by the nations of Western Christendom;" for we know that the Romans employed solid types or stamps, with raised letters, for the purpose of taking off short inscriptions, and the Visigoths in Spain printed the signs which they affixed to their deeds and charters. The silver letters of the "Codex Argenteus" are by some thought to have been produced by metal types.

HENRIETTA.

Pray, aunt, what is that?

MRS. F.

It is a copy of the translation of the Gospels by Ulphilas, who was bishop of the Mæso-Goths in the 4th century. This is the most ancient document extant of the Gothic tongue, from which all the modern northern languages are derived, and it is now preserved in the University of Upsal, having formed part of the booty at the taking of Prague in 1648.

FREDERICK.

But why is it called *Argenteus*?

MRS. F.

Because the binding of the book, and its letters, are of silver. The parchment, I should also tell you, is purple. But, as I mentioned before, metal types are by some supposed to have been used in it; and block printing, we know, was understood at an early period in China, where its operation must have been witnessed by Marco Polo, the celebrated Venetian traveller of the 13th century.

HENRIETTA.

I never heard of Marco Polo.

MRS. F.

Then I recommend you to read his life, because he is a character of no small literary importance. Marco Polo is no

less celebrated for the singularity of his adventures and the vast extent of country through which he traversed, than for the effect produced by the relation of his travels upon the progress of navigation and commerce. The north and east of Asia, the islands of the East, and the extremity of Africa were then wholly unknown; and thus Marco Polo, and the learned cosmographers who first gave credit to his narrative, may be said to have prepared the way for the two greatest geographical discoveries of modern times—the Cape of Good Hope, and America. By Marco Polo's travels, the erroneous notions of the ancients disappeared; science became regenerated; and if, in the long series of ages, we search for those men who, by the greatness and influence of their discoveries, have most contributed to the progress of geography and a knowledge of the globe, the modest name of the Venetian traveller may be placed in the same line with those of Alexander the Great and Christopher Columbus.

ESTHER.

Were his travels believed at the time?

MRS. F.

His narrative was read with eagerness, but was considered, by many, to be such a tissue of falsehood and exaggeration, that the friends and relatives of Marco Polo entreated him, when on his death-bed, to retract or disavow the passages which the world regarded as fiction; but Marco Polo declared that, so far from having exaggerated the truth, he had not related half the wonders to which he had been eye witness; but, like our own countryman Bruce, he could not gain credence for what subsequent travellers have proved to be fact.

FREDERICK.

I can't see why he was not believed?

MRS. F.

When we take the knowledge of the age into consideration, there was nothing extraordinary in the incredulity of the public; for the Tartars were, at that time, considered as

savages scarcely possessing the human form: and, when Marco Polo spoke of a Tartar empire larger and more civilised than the whole of Europe, governed by an emperor, having a court and regular tribunals of justice—when he spoke of China, its manners and institutions, so remote from those which were then known, of animals of new forms, and of natural phenomena so strange—how could he expect, in an ignorant age, to gain credence for half the wonders which he recounted ?*

* Walckenaer, in *Biographie Universelle*.

CHAPTER III.

THE FLOWER GARDEN.

MIMULUS MOSCHATUS. — CENTAUREA MOSCHATA. — MUSCARIA PINNA-
TIFIDA. — MUSK RAT. — GOAT MOTH. — ACANTHUS. — CARTHAMUS
TINCTORIUS. — ROUGE. — CROCUS SATIVUS. — CARLINA AGAULIS.
— ONOPORDUM ACANTHIUM. — AZALEA PONTICA. — GEOGRAPHI-
CAL DISTRIBUTION OF BEES. — HONEY OF MADAGASCAR AND OF
NARBONNE. — BODY OF ALEXANDER THE GREAT. — GRAFTS. —
APPLES AND FISH IN WAX. — LEAF-CUTTING AND MASON BEE. —
HUBER. — INSECTS ON COMPOSITÆ. — DAHLIA. — ARBUTUS. — CA-
MELLIA. — CALMUC TEA. — STEPPES OF ASIA.

“ Methinks I see great Dioclesian walk
In the Salonian garden’s noble shade,
Which by his own imperial hands was made.
I see him smile, methinks, as he does talk
With the ambassadors, who come in vain
T’ entice him to a throne again.
‘ If I, my friends,’ said he, ‘ should to you show
All the delights which in these gardens grow,
’Tis likelier far that you with me should stay
Than ’tis that you should carry me away:
And trust me not, my friends, if, every day,
I walk not here with more delight
Than ever, after the most happy fight,
In triumph to the capitol I rode,
To thank the gods, and to be thought almost myself a god.’ ”
COWLEY’S *Garden*.

THE next day being fine, Mrs. Fortescue proposed a visit to Mrs. Clifford.

“ What a delightful smell of musk!” exclaimed Henrietta, as they passed by a bed of small yellow flowers.

MRS. CLIFFORD.

That is the *Mimulus moschatus*, which affords, I believe the strongest instance of musk in the vegetable kingdom. I have seen a perfume distilled from this plant, which is nearly as powerful as the animal musk.

MRS. F.

But the Sweet Sultan (*Centaurea moschata*) emits also a strong musky smell; and this pretty little white flower, *Muscaria pinnatifida*, is likewise very powerful.

MRS. C.

I have a great dislike to the smell of musk; and, when I was in India, I used to be much annoyed by the musk rat, whose smell is so strong, that, if one of these animals passes over a bottle of wine, the subtle particles of the musk penetrate the cork, and impart so disagreeable a flavor to the wine, that it is impossible to drink it.

FREDERICK.

I once kept the caterpillar of a goat moth* for some time, and it smelt as strongly of musk as any of these flowers.

ESTHER.

How did you contrive to secure it, Frederick; for the goat caterpillar will eat through a common deal box?

FREDERICK.

My box was coated with tin, and bored with small holes to admit the air. I used to feed the caterpillar mostly upon apples, of which it would eat a great quantity in the course of the day. These caterpillars live, as you know, inside the trunks of willows and other trees; and mine appeared to dislike the air so much, that, whenever I took the cover off the box, it would spin a web over itself by way of protection.†

MRS. F.

The muscular powers,‡ the voracity, the long duration of

* *Cossus ligniperda*.

† Fact.

‡ According to Lyonnet it has 4041 muscles.

this caterpillar, and all the interesting details of its history, are so fully described from the labors of Lyonnet and other naturalists, that you will have read almost every particular concerning it in the volumes upon Insects published in the "Library of Entertaining Knowledge." But here, Frederick, is a plant which you will be pleased to see, the Acanthus,* so celebrated in your classic reading.

HENRIETTA.

Oh! you refer, aunt, to the story of Callimachus, and the invention of the Corinthian capital?

MRS. F.

Virgil also makes mention of it; he describes the dress of Dido, which had originally belonged to Helen, as being embroidered with the Acanthus.†

ESTHER.

What a brilliant orange this flower is!



Carthamus Tinctorius.

MRS. C.

That is the *Carthamus tinctorius*, the Safflower or Saffranum of commerce, which is cultivated chiefly in Spain and in the Levant. The flowers contain a yellow and a red coloring matter; the latter only is used. *Rouge* is the red

* *Acanthus mollis*.

† *Aeneid*, b. i. l. 649.

coloring matter, obtained by digesting the flowers in a solution of carbonate of soda, and adding lemon juice, which throws it down in the form of a fine powder, which is dried and mixed with a portion of talc. *Carthamus* is likewise used to dye woollens and silks, and also is employed to adulterate the true saffron, which consists, as you all know, of the fragment stigmas of *Crocus sativus*.

MRS. F.

Yes; at Saffron Walden, in Essex, where it was said to be introduced in the reign of Edward III, the meadows are purple, in the autumn, with the flowers of this *Crocus*, which is cultivated there solely for the saffron; and I have heard that the corporation of Walden bear three saffron plants in their arms.

MRS. C.

Here is a plant which you do not often see in the garden.

MRS. F.

Oh! *Carlina acaulis*, a plant I have constantly seen growing wild on the Continent; and in Sicily, its receptacle is eaten as we do in England that of the artichoke. But, while we are on the subject of thistles, allow me to point out to my little party that fine *Onopordum acanthium*, which, I believe, is generally cultivated as the true Scotch thistle.*

ESTHER.

Here is the American part of the Garden, which looked beautiful in the spring.

MRS. F.

I see, Mrs. Clifford, that you keep bees; are you not afraid that they should gather the honey of your Azaleas and Kalmias?

MRS. C.

I have never heard of any ill consequences attending their doing so.

* Hooker.

MRS. F.

But most of that family* are supposed to be noxious. In 1790, when there was an extensive mortality among those who had eaten the honey collected in the vicinity of Philadelphia, it was ascertained that the honey was chiefly extracted from the flowers of *Kalmia latifolia*, and, as you recollect, it is supposed that the honey which proved so fatal to the Army of Xenophon was collected from the Azalea.

FREDERICK.

Do you mean, aunt, in the famous retreat of the Ten Thousand, after the battle of Cunaxa?†

MRS. F.

Precisely so. Tournefort, who travelled in Asia Minor, ascertained that *Azalea pontica*, which grows plentifully about Trebizond and its vicinity, produces effects similar to those which Xenophon describes as having been experienced by those among his soldiers who ate of the honey of Trapezus;‡ and Tournefort brings in corroboration of his assertion the testimony of Father Lamberti, a missionary, who observes that the honey collected by the bees from a certain shrub (answering, by his description, to the *Azalea pontica*,) which grows commonly in Colchis, is highly pernicious, and excites sickness, headachs, &c. He also adds, that the smell of the flower resembles that of the honeysuckle, but is much stronger.§

MARY.

Did many of Xenophon's army die?

MRS. F.

None. Xenophon relates that those who ate of the honey-comb lost their senses, and were seized with sickness and giddiness. Those who had taken much, felt as if they had been intoxicated; those who had had more, like mad or dying persons. In this state, they laid down upon the ground:

* Rhodoracæ.

† B. C. 401.

‡ The ancient name of Trebizond.

§ Milne's Botanical Dictionary.

none of them died, but the next day they recovered their senses, and on the third or fourth, they were able to stand.*

MRS. F.

I have seen people suffer very severely from eating honey in this country. It is a singular fact in the geographical distribution of insects, that the honey and wax of Europe, Asia, and Africa are all prepared by bees of the same genus with our common hive bee;† while in America the genus *Apis* is no where indigenous, but is replaced by two other genera,‡ and in New Holland by one still more different.§

MRS. C.

The other day, I had a present made me of some green honey, which is much esteemed for its perfume, as well as for its other qualities; and is, I am told, collected by the bees of Madagascar on the mountains, from the heath which grows, in that country, to an enormous size.

MRS. F.

In Ireland, the honey collected from the mountain heath is also highly esteemed; but the Narbonne honey is said to derive its peculiar taste from the quantity of rosemary which grows in the neighborhood.

FREDERICK.

The ancients used, sometimes, to put dead bodies into honey, in order to preserve them from putrefaction.

MRS. F.

Yes; according to Statius, the body of Alexander the Great was so deposited. Honey was also poured upon the Tyrian purple, to keep it fresh; and some, that had been thus preserved unimpaired for 200 years, was found at Susa by Alexander the Great.

* Anabasis, b. iv. chap. viii.

† *Apis*.

‡ *Melipona* and *Trigona*.

§ Lyell's *Geology*, vol. ii. p. 114.

MRS. C.

I have been told, by an eminent botanist,* that the best mode of conveying grafts of trees, cuttings of vines, &c. to a distance, is to place them in a tin case or cylinder filled with honey. The honey hermetically excludes the air, and cuttings so preserved, will vegetate many months after they have been packed.

MRS. F.

Wax is still employed, in the East, to cover fish which they wish to transport to a distance; and apples are thus sent from South to North Russia.†

MARY.

Look, what a curious leaf this is! It appears to have little round pieces cut out of it with a pair of scissors.

MRS. C.

It is the work of the little Upholsterer Bee,‡ a busy inmate of my garden. The leaves of the China roses seem peculiarly its favorite; but I have found other serrated leaves, besides those of the roses, cut in the same way. There is an interesting description of the manner in which it pursues its occupation in the "Library of Entertaining Knowledge;"§ but though so many of the leaves in my garden are thus cut, I have never been able to see the little animal at work, nor have I ever discovered one of its nests.

HENRIETTA.

How very wonderful that it should cut them so exactly!

MRS. C.

"The little rose-leaf cutter, pursuing her work with the nicest mathematical art—using no artificial instruments o

* Professor Gussone.

† Beckman's History of Inventions, vol. ii. p. 51.

‡ *Megachile centuncularis* (Latreille).

§ Insect Architecture.

form her ovals and her circles, knowing that the elastic property of the leaves will retain them in their position—making her nest of equal strength throughout by the most rational adjustment of each distinct part—demands from us something more than mere wonder; for such an exercise of instinctive ingenuity at once directs our admiration to the Great Contriver, who has so admirably proportioned her knowledge to her necessities.”* One year a Mason Bee† made its nest in the lock of the garden door, and filled all the wards with her cells. I am very partial to bees, and have purchased some of the newly-invented hives, by means of which the honey may be taken without destroying the bees. By opening a valve in the top of the hive, a current of air is admitted, which causes the bees immediately to forsake the hive, and the honey can be taken without their suffering any injury.

MRS. F.

These hives must be, indeed, a source of great pleasure to every benevolent naturalist, for it seems a cruel fate to await these poor little industrious creatures at the close of their successful labors; and so impossible have I found it to reconcile their destruction to my feelings, that I have never kept bees myself, though the writings of Huber have so much interested me in their economy, that I should have liked to have watched them more closely.

ESTHER.

Was not Huber blind, mamma?

MRS. F.

Yes, from an early age. Huber is a beautiful example of cheerfulness and resignation under the most afflicting trials; and the patience and sagacity with which, under such apparently invincible obstacles, he pursued the study of nature, is a fine lesson to us how perseverance and intelligence may

* Insect Architecture, p. 63.

† *Megachile muraria*.

arrive at the most brilliant results, in spite of every physical disadvantage.

FREDERICK.

Pray, aunt, tell us more about Huber.

MRS. F.

Huber was a native of Geneva, and early began to cultivate his taste for literature and science; thus laying up a store of ideas and impressions for the pilgrimage of darkness he was called upon later to endure. At fifteen, his sight began to fail, and the oculists pronounced the probability of approaching blindness. Mademoiselle Lullin and Huber were mutually attached to each other from the age of seventeen; and, determined not to abandon her friend in his misfortunes, this heroic young lady resolved to marry him as soon as she should attain her majority.* Her married life realised the promise of her early devotion; and Madame Huber, during the forty years of happiness they were permitted to enjoy, was his secretary, his companion, the partner of his studies and of his pursuits. Indeed, such was her unwearied attention, so many ways did she find to gladden his darkened existence, that, as he feelingly observed in his declining years—"While she lived, I never was conscious of the misfortune of being blind."† We have seen the blind illustrious as poets and musicians, as philosophers and mathematicians;‡ but it was reserved to Huber first to distinguish himself in the sciences of observation, and upon objects so minute as to be perceived with difficulty by even the most clear-sighted observers. The works of Réaumur and Bonnet§ first directed his curiosity to the study of bees, and the desire of verifying some of the facts in their history, led him to a series of observations on their economy.

* Then fixed at twenty-five.

† During the war, Madame Huber used to put her husband in possession of the movements of the armies by arranging squadrons of pins on a map, so as to represent the different bodies of troops.

‡ Homer, Milton, Salinas (Professor of music at the University of Salamanca), Saunderson, Euler, &c.

§ With whom he was personally acquainted.

HENRIETTA.

But, aunt, how could he make any observations when blind?

MRS. F.

By employing the eyes of others. He had, then, an intelligent and devoted servant, François Burnens, whom he trained to the task; and such was the enthusiasm that Huber inspired in those around him, that Burnens would brave the fury of a whole hive, or seize a wasps' nest in spite of the stings of the horde of wasps who defended it, in order to arrive at some fact which his master was desirous of ascertaining. Huber's wife, and subsequently his son, assisted him also by their observations; and, by attentively listening to their recitals, Huber was enabled to form so clear an image of what they described, that, as he once gaily observed to Professor Dé Candolle—"I am much more sure than you of what I relate, for you publish what your eyes alone have seen, whereas I take the medium between several witnesses;" a plausible mode of reasoning, perhaps, but happy was it for him that religious resignation had taught him thus to view his infirmity.

ESTHER.

What were Huber's principal discoveries?

MRS. F.

He determined the origin of the wax, and of the propolis; he discovered how the bees prepared the former for their cells; he assigned the part which each class of bees takes in the construction of the hive; he described the battles between the queen bees; studied the origin of the swarms, and first gave a detailed history of these flying colonies; he proved the use of the antennæ in enabling the bees to distinguish each other; he determined the influence of the size of the cell upon the size of the insect which issues from it; and showed the ravages committed among the hives by the Death's-head Moth (*Sphinx atropos*). He also made many curious researches upon the respiration of bees, from which he discovered that these insects, by a peculiar movement of their wings, agitate

the air so as to renew its vital properties and replenish the oxygen gas, which they consume like other animals. In short, so profound were his observations, and so just his conclusions, that since his death nothing material has been added to their history, and naturalists blessed with the power of vision have had no important observations to join to those of their blind but persevering colleague.

HENRIETTA.

When did Huber die?

MRS. F.

In December, 1831, at the age of eighty-one, in the possession of all his faculties, cheerful and resigned to the last. On the 20th of that month he wrote to a friend—"Resignation and serenity are blessings which have not been refused to me." Two days afterwards, he expired without pain in the arms of his daughter. Such was Huber: religious, wise, and good; amiable and animated in conversation; delighting in the society of young persons; firmly attached to his friends, whose kindness and affection offered him a compensation to his misfortune which he had the good sense to enjoy and to appreciate. He never was the first to speak of his calamity; he never complained, for he considered resignation and cheerfulness as his first duties. The sagacity of his researches places him in the highest rank among naturalists; and though he confined himself to the special observation of one insect, yet his brilliant imagination would often indulge itself in general ideas, and he loved to admire the Great Author of Nature in the harmony of His works. In short, in whatever point of view we consider the character of this amiable man, he is highly deserving our admiration. His example may teach us to turn every dispensation of Providence to our good, and shows us how, by perseverance and patience in well doing, we may attain the most brilliant results, under obstacles the most discouraging, and calamities the most depressing.* It shows us how, even though deprived of the most

* The discovery by Captain Hall of the stingless bees at Tampico excited his interest, and nothing could exceed his joy at a friend

valuable of our senses, what resources we have still within ourselves, and leads us to bestow more attention upon the cultivation of those faculties which are left to us, so as to render them the more efficient by the greater call upon them for exertion.*

MRS. C.

I must join my thanks, Mrs. Fortescue, to those of your young people for this account of Huber, whose character I never before was sufficiently acquainted with. Milton's touching lines upon his blindness must be so familiar to you all, that we will ask Esther to repeat them.†

Esther recited them with much taste and feeling.

HENRIETTA.

But, not yet to forsake our favorite bees, look what numbers of them there are on that *Coriopsis*.

MRS. C.

Yes: do not you know that all the *Compositæ* (or Composite flowers) are particular favorites of insects?‡ The Dahlias, when in bloom, are always covered with insects, and especially with bees, which you often see upon the flower, either so laden or so stupified as to be almost unable to move.

HENRIETTA.

Pray, how do you pronounce the name of that flower?

MRS. C.

Usage admits of our saying *Dalia*; but, independent of that

procuring him a hive of them. This was his last labor in behalf of his old friends, to whom he had directed the researches of his life, and to whom he owed his celebrity, and, in a great measure, his happiness. The above account is mostly taken from De Candolle's "Notice" upon the life and writings of Huber.

* The memory, one of the highest faculties of the mind, is always most powerful in blind persons.

†

Seasons return; but not to me returns

Day, or the sweet approach of even or morn," &c.

‡ Sir J. Smith.

pronunciation confusing these plants with the papilionaceous genus *Dalea*, it also is radically wrong, for the flower is named after Andrew Dahl, a Swedish botanist, who first brought it from Mexico, and consequently it should be called *Dahlia* after him.

FREDERICK.

Arbutus, too, is generally pronounced wrong; for, according to Virgil,* it should have the accent on the first syllable, the *u* of the second syllable being short.

MRS. C.

In the same manner, *Camellia* should have both *l*'s pronounced; the planets being so called after Joseph *Kamel*, a Jesuit, whose name is usually spelt *Camellus*.

ESTHER.

Some one was telling me, the other day, that Camellias are used by the Chinese for flavoring their tea.



Camellia Sesanqua.

MRS. C.

So I have understood: the leaves of *Camellia Japonica* and *Sesanqua* are often employed in China and Japan instead of those of the true tea; and many of the different species of the genus *Thea* are used, almost indifferently the one for the other, by the inhabitants of China, Japan, and Cochin-China.

ESTHER.

Are the Camellias, then, a species of tea?

* Eclogues, iii. 82. and vii. 46.



Camellia Japonica.

MRS. C.

Yes: according to De Candolle, they all form one order, *Camellia*,* and being so nearly allied, they possess, though in different degrees, the same properties; but the peculiar flavor of some of the kinds of tea is imparted to them by the tea leaves being placed in alternate layers with the flowers of either *Camellia sesanqua* or of *Olea fragrans*,† a plant which you will see growing in my hot-house. With the preparation of tea as we receive it here, you all, doubtless, are acquainted; but you probably are not aware how the Calmucs prepare theirs. “It is imported from China to Siberia, and consists of the coarse leaves and stalks of the plant, which are formed into cakes sixteen inches long, eight inches broad, and more than an inch thick. A portion of this is cut off with a knife, and boiled with butter and fat from the tails of their sheep; a little salt is added, and sometimes milk. Before these last ingredients are put into the kettle the settlement is taken out with a bag and an iron hook (a good deal like a fish hook,) and these leaves are added on the next occasion to the fresh tea. When all is ready, the tea is ladled out of the kettle with a wooden spoon, and served in the common wooden bowls or cups which the Calmucs use to drink out of.‡

* *Camellia thea* (Bohea tea,) *Camellia viridis* (green tea.)

† De Candolle.

‡ Zwick and Schill's Journey to Calmuc Tartary, p. 99.

MARY.

In what part of Asia do the Calmucs live?

MRS. F.

The inhabitants of the vast plains, or *steppes*, which extend northward from the Black Sea and Mount Caucasus, on both sides of the Volga, are known under the name of Calmucs. They belong to the Mongolian race, are divided into five *hordes* (in the Mogul language *orda*,) each governed by its own khan or chief. Their wealth consists in their camels, horses, oxen, sheep and goats; these supply all their wants, or afford them the means of satisfying them. They live in tents; 20,000 tents or families of Calmucs inhabiting the government of Astrachan. In the winter they drive their herds from the steppes into regions better furnished with water.

ESTHER.

What dreary places these steppes must be!

MRS. F.

So, indeed, they are. The steppes of Asia extend over more than 2000 leagues, and are the most vast and elevated in the world. Those in the government of Astrachan are among the most desert parts of the Russian empire. The soil consists of a yellow clay, without stones, and abundantly impregnated with various salts. Vegetation is extremely scanty, consisting chiefly of wormwood, interspersed with tufts of grass, which never entirely cover the ground, or form a uniform turf, the yellow clay being seen between. Here and there are more fertile spots, covered with saline plants, or adorned with the brilliant flowers of the Iris and the Tulip.

ESTHER.

Is the heat very great there?

MRS. F.

In the southerly steppes the thermometer often remains, for weeks together, at 30 degrees of Reaumur,* and not a

* See page 210.

single refreshing cloud appears in the heavens; while, on the other hand, the cold in winter is intense, the thermometer being then as many degrees below the freezing point; and this is felt the more because no mountains intervene to keep off the cold air from the east, which comes from the lofty, ice-covered Mongolia in an irresistible stream.

ESTHER.

Do many animals inhabit these deserts?

MRS. F.

Wild horses, antelopes, foxes, and wolves are its chief occupants. Serpents and lizards are very common, and so is the locust, which devastates whole provinces. Scorpions are local, but the tarantula, and the still more poisonous scorpion spider, which the Calmucs call the black widow, are every where to be met with, and to be dreaded.

MARY.

Are there steppes in any other part of the world?

MRS. F.

Yes, in all; and if you will remind me, another time, I will give you some account of them. At present, we must direct our attention to the flowers around us; and let us follow Mrs. Clifford into the hot-house.

CHAPTER IV.

THE HOT-HOUSE.

BAUHINIA. — IPOMCEA COCCINEA AND QUAMOCLIT. — HIBISCUS ROSA-SINENSIS. — HIBISCUS ESCULENTUS. — MALVACEÆ. — COTTON. — ILLICIMUM FLORIDANUM AND ANISATUM. — ANISETTE. — MARASCHINO. — MERISES. — MAYDUKE. — BIGARREAU. — KIRSCHENWASSER. — WALNUTS. — VANILLA. — VIOLET SHERBET. — BERTOLA'S LINES TO THE VIOLET. — ROSE APPLE. — INDIAN RUBBER. — BANYAN TREE. — MILTON, SOUTHEY, AND MOORE'S LINES. — DRAGON TREE OF OROTAVA. — BAOBAB. — COCOA NUT. — MONKIES TRAINED TO FETCH THE FRUIT. — SEYCHELLES ISLAND COCOA NUT. — ALBUMEN. — ORANGE TREES AT SORRENTO.

“How exquisitely sweet
This rich display of flowers!
This airy wild of fragrance,
So lovely to the eye,
And to the sense so sweet!”

HENRIETTA.

WHAT a curious saddle-shaped leaf this creeper has!

MRS. CLIFFORD.

Yes; it is divided into two singular, oval lobes. The plant is the *Bauhinia*, a climber of South America, in the woods of which, it twines round the highest trees, and the monkeys use it for ladders. On the borders of the Orinoco, its leafless branches are often forty feet long. Sometimes they fall perpendicularly from the elevated top of the Mahogany;* at others, they stretch themselves diagonally from one tree to another, like the ropes of a ship, and the tiger-cats run up

* *Swietenia Mahogani* De Candolle.

and down them with wonderful agility.* Here, too, is another beautiful creeper, the delicate pinnated leaves of which, give it the most feather-like appearance, and its brilliant crimson flowers far surpass its kindred and more hardy species, the *Ipomœa coccinea*, a common garden annual. This is the *Ipomœa quamoclit*, and its fleshy root is converted by the Indians into a kind of snuff.†

MRS. F.

Look at this beautiful scarlet Hibiscus.

MRS. C.

That is *Hibiscus rosa sinensis*, or daily Rose; the Chinese employ it to blacken their hair and eyebrows, and also the leather of their shoes.‡ For the latter purpose, the Malays at Singapore (in the employ of the Europeans) also use it, by rubbing the shoes with the petals of the flower, which contain a quantity of purplish black astringent juice. It possesses, certainly, the advantage over our blacking, of not coming off, and thus preventing the white dresses of the Easterns from being sullied by the shoes. The Europeans have given it, in consequence, the name of *shoe-flower*. Another species of Hibiscus (*H. esculentus*), the Okro plant, is much eaten in tropical countries; and in Africa, the flowers of many species of this beautiful tribe are used by the women to decorate their hair.§

ESTHER.

They are of the family of Malvaceæ, are they not?

MRS. C.

Yes; and to the same family the Cotton tree belongs. The seeds of many genera of this family are surrounded by woolly or silky filaments; those of the cotton, when viewed with a microscope, are covered with small teeth or notches, which

* Humboldt, Tableaux de la Nature.

† De Candolle.

‡ Ibid.

§ Stories of Strange Lands, by Mrs. R. Lee.

render them so easy to weave, and which explains how the textures made from them irritate or scratch the skin.

HENRIETTA.

That is the reason, I suppose, that so many persons do not like wearing calico, and that it is never used for dressing wounds?

MRS. F.

Precisely so. In the vegetable, as well as in the animal kingdom, we find that those hairs which, when seen by the microscope, appeared to be toothed, are alone capable of felting.* Here is the species which furnishes the Nankeen cotton;† and this is the common species.‡

ESTHER.

Pray, Mrs. Clifford, what is this pretty star-shaped crimson flower?

MRS. C.

Illicium floridanum. Another species of the same genus, *Illicium anisatum*, is a plant much used by the Chinese. Its smell is sweet and aromatic; its taste a little bitter. They employ it to burn in their temples, and the Europeans use it to flavor several of their liqueurs — among others the celebrated *Anisette de Bordeaux*.§

HENRIETTA.

And what is *Maraschino* flavored with?

MRS. F.

With a small black cherry, which is generally denominated in England, among the gardeners, the *Guisnes* cherry, they having been probably imported from thence. By the country people, they are often termed *merries*, which last name is a corruption of their French appellation, *merises*.

* De Candolle.

† *Gossipium religiosum*.

‡ *G. herbaceum*.

§ De Candolle.

MRS. C.

In the same manner that *Mayduke* is derived from the *Pays de Medoc*, a part of France where that variety of cherry abounds; and *bigarrou* is a corruption of *bigarreau*, an epithet given to the cherry, from its beautiful red-and-white mottled appearance — but, I am interrupting you, Mrs. Fortescue.

MRS. F.

This Guisnes cherry, or *merise*, grows in Dalmatia, where it is called *marasca*,* whence the liqueur derives its name. It is chiefly manufactured at the little town of Zara, so celebrated in modern history,† from which place it is sent to Venice and Trieste, and thence to every part of the world. But this is not the only liqueur made from cherries; the German *kirschenwasser* (the word only meaning cherry-water) is distilled from the cherry.‡

ESTHER.

Where is it made?

MRS. F.

The best is manufactured in the Black Forest, so celebrated as the scene of many a German legend. In all that part of Germany, cherries are most abundant, and are sold at the most trifling price. With the Germans, stewed cherries are a favorite dish, and they eat them with their roasted meat.

ESTHER.

Are not walnuts, also, very common in Germany?

MRS. F.

Yes; although the tree is not indigenous to Europe, but is supposed to have been introduced from Persia and the borders

* An abbreviation of *amarasca*, from its bitter flavor.

† For its siege, in 1201, by the crusading princes, and
——— “blind old Dandolo!

Th’ octogenarian chief, Byzantium’s conquering foe.”

‡ *Cerasis avium*.

of the Caspian Sea.* The Germans cultivate them chiefly for the oil which their nuts afford.

MRS. C.

With us they flourish mostly in Surrey, which county almost entirely supplies the London market with this fruit. But here is also a plant, the perfume of which you are well acquainted with, the *Vanilla aromatica*, a creeping parasitical plant, which fixes its roots in the trunks of trees in tropical climates. You see, I keep mine in cocoa-nut shells filled with moss, which answers the same purpose. It does not produce fruit in this country; but I have in the house one of its long, cylindrical, fleshy pods, which is so much valued for its delicate and delicious aroma, and with which liqueurs, ices, &c., are so often flavored.



Vanilla Aromatica.

ESTHER.

I have read that the sherbet of the Turks is prepared from the flowers of the violet.†

MRS. C.

Yes; that which is most esteemed, and which is drunk by the Grand Seigneur himself, is made of violets and sugar.

* Voyage dans l'Empire de Flore.

† Hasselquist and Tavernier.—“The violet sherbets were hastily handed round.”—MOORE.

MRS. F.

Among the numerous lines written upon this flower, which really rivals the rose in the admiration with which it has inspired poets, is a pretty sonnet of the Italian poet Bertola, which Esther will repeat to you, Mrs. Clifford; but, I fear we must translate it for the rest of our party, except for Henrietta, who understands Italian.

Esther repeated the following verses to

LA VIOLA MAMMOLA.

"O bella mammola tutta modesta,
Il prima zefiro d' April ti desta:
Vivi rinchiusa, ma in lontananza
La tua ti accusa dolce fragranza:
O bella mammola, mammola bella,
Sii tu l' imagine d' ogni donzella!

"Chi brama coglierti, se avanza il piede,
Gia sta per premerti, ne ancor ti vede:
Pure e gentili le tue fogliette
Fra l' erbe vili giaccion neglette.
O bella, &c.

"Quando col crescere di primavera,
Dei fior piu nobile cresce la schiera,
Ch' apron piu vaga piu altera foglia:
Ti stai tu paga che niun ti coglia.
O bella, &c.

"Madre, consolati se la tua figlia
A bella mammola tutta somiglia:
Ne mai lagnarti se d'arti e senza;
Che far dell' arti dov' e innocenza?"

MRS. C.

Thank you, Esther. I never heard them before.

MRS. B.

Here is a tropical plant, which I have seen in full fruit in Italy, where it is also used for flavoring the *sorbetti* (or sherbet,) the *Eugenia Jambos*, or Rose apple, of the West

Indies. My tree produces fruit constantly. Taste it: the flavor, as well as the smell, precisely resembles the otto of roses; and the tree, laden with its round yellow fruit, has a very pretty effect; but the dryness of the fruit renders it unfit for eating, though it is sometimes used to feed pigs, who devour it greedily. This, too, is a tree which will be interesting to you, as it is one of those which afford the Indian rubber.

HENRIETTA.

Is there more than one tree which produces it?

MRS. C.

Yes, several. They are mostly included in the families *Euphorbiaceæ*, *Urticæ*, *Apocynæ* and *Campanulacæ*.* This is the *Ficus elastica*; prick either the bark or the leaf, and you will see a white, glutinous liquid issue from it, which hardens by exposure to the air. But here is another species of *Ficus*, which you know well by name, but of which this is but a miniature representation; the celebrated Banyan tree† of the East Indies.



Banyan Tree.

ESTHER.

I remember Milton's description of it very well.†

* The Indian rubber of commerce comes from *Hevea Cahuchu*, *Lobelia Caoutcha*, *Castilleja elastica*, *Ficus* and *Urceola elastica*, &c. (Humboldt, *Voyage aux Regions Équinoxiales*, vol. vii. p. 330.)

† *Ficus Indica*.

"The fig tree, not that kind for fruit renown'd,
 But such as at this day to Indians known
 In Malabar or Deccan, spreads her arms
 Branching so broad and long, that in the ground
 The bended twigs take root, and daughters grow
 About the mother tree, a pillar'd shade
 High overarched, and echoing walks between;
 There oft the Indian herdsman, shunning heat,
 Shelters in cool, and tends his pasturing herds
 At loop-holes cut through thickest shade."

MRS. C.

It is given quite with the pen of a naturalist.

MRS. F.

Southey also describes it minutely in his "Curse of Kehama:" —

"'Twas a fair scene wherein they stood,
 A green and sunny glade amid the wood,
 And in the midst an aged Banian grew.
 It was a goodly sight to see
 That venerable tree;
 For o'er the lawn, irregularly spread,
 Fifty straight columns propt its lofty head,
 And many a long depending shoot
 Seeking to strike its root,
 Straight, like a plummet, grew towards the ground.
 Some on the lower boughs, which crost their way,
 Fixing their bearded fibres, round and round,
 With many a ring and wild contortion wound;
 Some to the passing winds, at times, with sway
 Of gentle motion swung;
 Others of younger growth, unmoved, were hung,
 Like stone-drops from the cavern's fretted height.
 Beneath was smooth and fair to sight,
 Nor weeds nor briers deform'd the natural floor;
 And through the leafy cope which bowered it o'er
 Came gleams of chequer'd light.
 So like a temple did it seem, that there
 A pious heart's first impulse would be prayer."

MRS. C.

And, if I do not fatigue you with quotations, I should like to repeat some beautiful lines of Moore to his Mother, in which he alludes to the Banyan: —

They tell us of an Indian tree
Which, howsoe'er the sun and sky
May tempt its boughs to wander free,
And shoot and blossom wide and high,
Far better loves to bend its arms
Downwards again to that dear earth
From which the life, that fills and warms
Its grateful being, first had birth.
'Tis thus, though woo'd by flattering friends,
And fed with fame (*if* fame it be,) *if*
This heart, my own dear mother, bends,
With love's true instinct, back to thee!

MRS. F.

Thank you; the simile is beautiful.

FREDERICK.

What is this very tall plant?

MRS. C.

That is the Dragon tree (*Dracæna draco*), one of the most common of the tropical trees. Its beautiful head of green leaves makes it appear to enjoy a perpetual spring. Among the people of Hawaii or Owyhee, it is the emblem of peace.* The tree attains such an immense size, that fishing boats have been made out of its trunk.† Pigs are fed upon its fruit; but, if you wish to read an interesting account of this tree, I must refer you to Humboldt's "Personal Narrative" for a description of the Dragon tree of Orotava.

FREDERICK.

Pray, where is Orotava?

MRS. C.

It is one of the islands of the Canaries, and on it is a gi-

* Beechey's Voyage.

† Bowdich's "Madeira."

gantic Dragon tree, which appears to have existed there for centuries; for tradition asserts, that it was of the same diameter when the island was conquered in the 15th century as it is at present.



Dragon Tree.

ESTHER.

And what is that?

MRS. F.

Sixteen feet. Its height is now from 50 to 60 feet, the circumference near the root 45 feet; and what renders it the more singular that this tree should have attained so enormous a size is, that it is not indigenous: the East Indies is its true country, and it is nowhere found on the continent of Africa. Those, therefore, which are growing in the Canaries, Madeira, and Porto Santo, prove from their age, that, at some very remote period, the inhabitants must have had intercourse with other people originally from Asia.*

MRS. F.

The *Dracæna*, with the Baobab, are probably among the

* Humboldt's *Voyage*, vol. i. p. 252.

oldest inhabitants of our planet. I think I see a small plant here of the latter, which I must point out to my little party, as it is one of the most interesting of the tropical trees.

ESTHER.

Is that the same as the Monkey Bread tree?

MRS. F.

Yes. It is also called the Ethiopian Sour Gourd:* its botanical name is *Adansonia digitata*.

ESTHER.

Where is it a native of?

MRS. F.

The natural territory of the Baobab is that part of Western Africa which lies between the Senegal and the Gambia; and it is to the verdant appearance given by these trees that Cape Verd owes its name. The tree belongs to the natural order of *Malvaceæ* (or the Mallow tribe). Its flowers are about 4 inches long and 6 in diameter. Being of a brilliant white, and pendent from long stalks, they form a beautiful contrast to the dark green of the leaves. They close at night; and it is the custom of the Africans to assemble round the Baobab at the approach of day, to watch the opening of its flowers, greeting them with the salutation of "Good day, beautiful lady!" The leaves, as the specific name implies, are digitate or finger-shaped, and are divided into five lobes: when young, they are employed by the natives to flavor their *kouskous*, and for many other culinary purposes. This is one of the few African trees (if not the only one) which loses all its leaves at the approach of the rainy season, when its long, bare, rude, irregular, hoary branches have a most grotesque effect, towering above all the other trees in the forest, the fruit still pendent from it, in long, twisted stalks, varying from 1 to 2 feet in length. Its bark is of a whitish hue. The fruit is about 18 inches in circumference, in the form of a double

* *Kouka* in the Soudan, according to Major Denham.

cone, covered with a rind which resembles dark green velvet. It is divided into 8 or 10 cells, each of which is filled with a buff-colored, farinaceous, pulpy substance, of an acid and agreeable taste. In some places, it forms a principal article of food, and the juice expressed from it is used as a cooling drink in fevers. The fruit is consequently an article of commerce, and is conveyed as far as Morocco and Egypt.

MRS. C.

Is the wood of the Baobab of any use?

MRS. F.

Of none. It is fibrous and soft, and is even unfit for burning. The middle is filled with a large proportion of pith, the decay of which occasions the great caverns so frequently found in these trees. Within these hollow trunks are suspended the bodies of those who are refused the rites of burial, and, in them, they become mummies, perfectly dry and well preserved, without any artificial preparation. The Baobabs grow in sandy soils; and their lateral roots, though often 100 feet in length, would of themselves be insufficient to enable the tree to withstand the violence of the wind, had not Providence given them also a pivot root, formed by a prolongation of the trunk in a vertical direction. Thus admirably defended, the Baobab resists the fury of the African tornadoes, and, undisturbed by the war of elements, remains fixed in its position, the oldest organic monument of our planet.

MRS. C.

I think I have understood that it is not a very lofty tree?

MRS. F.

No; its elevation is by no means proportionate to its breadth. Adanson says they are from 10 to 12 feet high, and 77 in circumference; their roots 110 feet long. Humboldt states them to be 12 feet high and 30 feet in diameter; and other travellers have assigned them even greater dimensions. The largest, I believe, on record is that in the valley of the two Gagnacks.

HENRIETTA.

Where is that, aunt?

MRS. F.

Between St. Louis and Goree. The tree, which was 104 feet in circumference, was situated a few paces from the village, and the assemblies of the people were always held in the enormous cavern formed in its trunk, which cavern was 20 feet high, and 21 in diameter. The form presented by the tree was that of a beautiful arch, flat and elliptical at top, and supported by a column 24 feet high; for it was at this elevation that the principal branches proceeded, and extended round the tree in a horizontal direction to the distance of 50 feet.

MRS. C.

But with regard to its age, how have they made those calculations which give it an existence coeval with the Deluge?

MRS. F.

By means of two trees which are in the Isles de la Madeleine, and which have their bark inscribed with Dutch names, bearing the date of 1449. Supposing these characters to have been engraved in the infancy of the tree, and comparing them with their dimensions when Adonson saw them, he endeavored to form a ratio of the progressive increase of the Baobab, from which he calculated that a tree of 30 feet in diameter must be 5150 years old, and must consequently have survived the Deluge; but, when we hear of such extraordinary calculations as this; and that of a modern botanist,* who gives even a greater age to the Deciduous Cypress,† we must suspect there is some great error in the data upon which they have formed such extravagant conclusions.‡

MRS. C.

I am sure, Mrs. Fortescue, that we are very much obliged

* M. Alphonse De Candolle.

† *Taxodium distichum*.

‡ Lindley.

to you for this very interesting account of the Baobab, which will much enhance the pleasure I have in watching my pigmy specimen.* Here is the Cocoa-nut tree (*Cocos nucifera*), which, in its native country, attains 70 or 80 feet in height. It does not begin to bear fruit until the fourth year, even in a damp and fertile soil; but in barren ground, not until the tenth year of its age.



Cocoa-nut.

MRS. F.

Does not the Cocoa-nut prefer salt to fresh water?

MRS. C.

Yes; it always grows best near the sea, and when planted inland, the cultivators throw half a bushel of salt in the hole made to receive the nut. It is not a long-lived tree, its duration seldom exceeding eighty to a hundred years; and it

* Tableaux de la Nature. Humboldt's Personal narrative. Golberry's Africa. Hooker in Botanical Magazine, vol. lv. &c. &c.

only bears abundantly till the age of thirty, when the crops gradually diminish.

ESTHER.

How many nuts will a tree yield?

MRS. C.

On an average, about a hundred.* Animals have often been trained to fetch down the Cocoa-nut and other fruits for their masters. The ourang-outang has been tamed by the savages of Borneo, and made to climb lofty trees to bring down the fruit. But he is said to yield his masters an unwilling obedience, and to be held in subjection only by severe discipline. One of the baboons of Sumatra (*Simia carpolegus*) appears to be more docile, and is frequently trained by the inhabitants to ascend trees for the purpose of gathering cocoa-nuts, a service in which this animal is very expert. He selects, says Sir Stamford Raffles, the ripe nuts with great judgment, and pulls no more than he is ordered. The capuchin and cacajao monkeys are, according to De Humboldt, taught to ascend trees in the same manner, and to throw down fruit, on the banks of the Lower Orinoco.†



The Ourang Outang.

* Humboldt's Personal Narrative, vol. iii.

† Hooker in Botanical Magazine, vol. liv., from which this account is taken.

HENRIETTA.

What is this strange-looking nut which is lying down here?

MRS. C.

It is the celebrated *Coco de mer*, or Cocoa-nut of the Seychelles Islands.

MRS. F.

The nut, I conclude, to which so many fabulous origins were assigned; but I am sure that Mrs. Clifford will kindly give us a more detailed account of it.

MRS. C.

With pleasure. Until the discovery in 1743 of the only spot in the world where these nuts grow, they were solely known from having been found floating on the surface of the sea, in the Indian Ocean, and near the Maldives, whence was derived their French name of *Coco des Maldives*. They have also received other appellations, such as Double Cocoa-nut, *Coco de mer*, *Coco de Salomon*, and *Nux Medica*.* The nut being only found in this manner (always destitute of its husk) gave rise to many fabulous stories among the Malay and Chinese sailors; such as, that it was borne by a tree deep under water, which was similar to the cocoa-nut tree, and was visible in placid bays upon the coast of Sumatra, &c., but that if they sought to dive after the tree, it instantly disappeared. The negro priests declared it to grow near the island of Java, with its leaves and branches rising above the water, in which a monstrous bird or griffin had its habitation, whence it used to sally forth nightly to tear to pieces with its beak, elephants, rhinoceri, &c., whose flesh it carried to its nest: furthermore, they avouched that ships were attracted by the waves which surround this tree, and there retained, the mariners falling a prey to this savage bird; so that the inhabitants of the Indian Archipelago always carefully avoid that spot. With such and many more strange ideas respect-

* *Lodoicea Sechellarum* (Labillardiere and Sprengel).

ing its place of growth and history, it is not wonderful that this nut should have been highly prized, and in the Maldivian Islands it was death to any man to possess it; all that were found, became the immediate property of the king, who sold them at a very high price, and offered them as the most precious of regal gifts. Their value was estimated at from sixty to a hundred and twenty crowns; but those which measured as much in breadth as in length were the most esteemed, and those which attained a foot in diameter were sold for a hundred and fifty crowns. Nay, some kings have been so greedy of obtaining these nuts, as to have given a loaded ship for a single fruit.

ESTHER.

What use did they make of them?

MRS. C.

The Chinese, as well as the natives of the Indian Archipelago, considered them as an antidote to all poisons, and as a preservative against apoplexy, paralysis, &c. The principal virtue was supposed to reside in the meat or albumen which lines the nut.

ESTHER.

I beg your pardon for interrupting you, but what is the albumen?

MRS. C.

It is "the substance which lies between the infant plant and the outer integument of a seed. It is usually wholesome, and may be eaten in the most dangerous tribes (as *Euphorbiaceæ*); while in many, it forms an article of food (as in wheat, and the other Cerealia, the Cocoa-nut, &c.)* But to return to the subject. The *albumen* was triturated with water in vessels of porphyry, and mingled with coral, ebony, and stag's horn, and then all drunk together.

* Lindley's First Principles of Botany.

HENRIETTA.

Again, I fear, I must interrupt you; but I do not know the meaning of the word trituated.

MRS. C.

It is the process of reducing any substance to a powder on stone, by rubbing it with a muller, in the same manner that colors are ground.

HENRIETTA.

Thank you.

MRS. C.

The great men of the Maldivian Islands formed of the shell precious vessels to hold their tobacco, betel, &c., believing that they could never be contaminated by any thing noxious. The discovery of the Seychelles Islands, and the knowledge thence derived that these nuts grow upon trees as other



Double Cocoa-nut Trees.

cocoa-nuts, soon reduced the value of this commodity; and now, probably, by the Indians, as well as by the Europeans, it is only sought as a matter of curiosity or for domestic purposes.

ESTHER.

Where are the Seychelles Islands?

MRS. C.

The Seychelles, or Mahé Islands, as they are sometimes called, lie to the northeast of Madagascar. It is in this group only, that the palm is found, and, even among them, in no others than the Isle of Praslin and Curieuse, and Round Island. These are within half a mile of each other, mountainous and rocky, and the soil poor. The common cocoa-nut occupies the sea-coast, but all other parts are, or have been, entirely covered with *Cocos de Mer*.

HENRIETTA.

Is it a handsome palm?

MRS. C.

Yes, remarkably so; its ordinary height is from fifty to sixty feet, but it sometimes attains a hundred, scarcely differing in size to the very top, where it is crowned with a tuft of from twelve to twenty leaves, of a bright yellow green, about eight to ten feet long, and five to six feet wide; but some have been measured as large as twenty feet. Twelve months elapse before the fruits are fully ripe, and they have been known to hang three years on the tree before falling on the ground.

MRS. F.

That is like the oranges at Sorrento, near Naples, which hang three years upon the trees.

MRS. C.

A nut remains a year in the ground before it germinates, and a tree is twenty to thirty years old before it bears fruit.

A tree produces from twenty to thirty nuts. These nuts are, as you see, about a foot long, almost black, and of a hard woody texture. A new leaf is formed on the tree annually, and, on falling away at the end of the year, it leaves a scar or ring. From these it is estimated that a tree takes 130 years to attain its full development. The crown of the trunk, in the middle of the leaves, is eaten, as in that of the true Cabbage Palm (*Breca oleracea*), but is less delicate, and slightly bitter; it is often preserved in vinegar. The trunk is used for palisades, &c.; the foliage, to thatch the roofs of houses, and even for walls. With a hundred leaves, a commodious dwelling may be constructed, including even the partitions, doors, and windows. In the Isle of Praslin, most of the cabins and warehouses are thus made. The down which is attached to the young leaves, serves for filling mattresses and pillows. The ribs of the leaves and fibres of the petiole (or leaf-stalk) are converted into baskets and brooms. The young foliage affords an excellent material for hats; for which purpose the unexpanded leaves only, are taken, dried in the sun, and cut into thin longitudinal stripes, which are then plaited, and scarcely any other covering for the head is worn by the inhabitants of the Seychelles. Out of the nut are made vessels of different forms and uses. When preserved whole, and perforated in one or two places, the shell serves to carry water, and two of them are suspended from opposite ends of a stick. Some of these nuts hold six to eight pints. If divided in two, between the lobes, each portion serves, according to the size and shape, for dishes, plates, or drinking cups, these being valuable from their great strength and durability. this kind of utensil bears in the Seychelles Islands the name of *Vaisselle de l'Isle Praslin*; and such is the estimation in which these nuts are held by the negroes and poor people of other islands, that the sailors always try to obtain them and make them part of the cargo of their vessels. Amongst other articles, shaving dishes—black, beautifully polished, carved, and set in silver—are made from them.*

* Hooker, in Botanical Magazine, vol. liv.

MRS. F.

Let me, my dear Mrs. Clifford, thank you, in the name of my party, as well as for myself, for this very interesting account. But, I think, we must go home.

MRS. C.

You had better first rest yourselves in the house.
To this they willingly assented, and left the garden.

CHAPTER V.

ON GLASS.

FAHRENHEIT AND REAUMUR.—GLASS FIRE SCREEN.—ICE WINDOWS.
 —GLASS OF POMPEII.—VENETIAN GLASS.—GLASS WINDOWS IN
 ENGLAND.—DISCOVERY OF GLASS.—SAND.—BARONS' CAVE AT
 BEIGATE.—BARILLA.—KELP.—FUCI, USES OF.—FUCUS NATANS.—
 WRACK.—FUCUS TENAX.—LAMINARIE.—FUCUS CRISPUS.—DULSE.
 —LAVER.—GELIDIUM.—CHINESE SWALLOW.—SOY.—RED SNOW.

HENRIETTA.

I DID not like to interrupt you, aunt, in the garden; but when you were telling us about the steppes of Asia, you talked of the heat being at 30° of Reaumur.* How high is that in our thermometer?

MRS. F.

Ours, and indeed most of the thermometers used in England, are graduated by Fahrenheit's scale, whereas on the Continent, Réaumur's is more frequently employed. The difference is this, that in Fahrenheit's scale, the freezing point is placed at 32 degrees, whereas in Réaumur's it is at zero. The degrees also of Fahrenheit's are less than Réaumur's in the proportion of 9 to 4: that is, nine degrees of Fahrenheit are only equivalent to four of Réaumur.

HENRIETTA.

How then do you convert one into the other?

MRS. F.

To bring Fahrenheit into Réaumur, you multiply by four

* See page 62.

and divide by nine, and subtract 32 degrees from the quotient, and *vice versa* when the opposite calculation is to be made. Let me see if you understand it, by telling me what height of Fahrenheit is equal to the 30 degrees of Réaumur of which we were speaking.

ESTHER.

30 multiplied by 9, equals 270; divided by 4, equals $67\frac{1}{2}$; add 32, equals $99\frac{1}{2}$, the degree of Fahrenheit.

MRS. F.

Very well; but now suppose it is below the zero of Réaumur, how would you then calculate it? We will say 40° below.

ESTHER.

We must then subtract the 32° , thus: 40 multiplied by 9, equals 360; divided by 4, equals 90; subtract 32, equals 58° below the zero of Fahrenheit.

MRS. F.

Now convert 50° of Fahrenheit into Réaumur, and write it down with the proper arithmetical signs.

ESTHER.

Here it is, mamma: $50 - 32 = 18 \times 4 = 72 \div 9 = 8$, the degree of Réaumur.

MRS. F.

I think now that you must all understand the difference most clearly. I see, Mrs. Clifford, that you have one of the new plate-glass screens; do you find it answer?

MRS. C.

Most perfectly.

HENRIETTA.

I do not understand how a plate of glass should keep out the heat of the fire; for when, in a sunny day, I sit in the

window, I feel the heat as great through the window as if I were sitting outside.

MRS. C.

This singular and important difference has been the subject of many curious experiments, and it is found that terrestrial heat (that is, heat radiating from fires or heated bodies) is intercepted and detained by glass or other transparent substances, while solar heat is not; and that terrestrial heat being so detained, heats the bodies through which it passes, which solar heat is incapable of doing. More recent researches, however, show that this detention is complete only when the temperature of the source of heat is low, and that as the temperature becomes higher, a portion of the heat radiated, acquires the power of penetrating glass.

ESTHER.

Then it is only because the sun is so much hotter than any terrestrial heat, that it is thus able to penetrate?

MRS. C.

Precisely so; and therefore this discovery is important, because it shows that solar and terrestrial heat are of the same nature; and, at the same time, it leads us to regard the actual temperature of the sun as far exceeding that of any earthly flame.*

ESTHER.

I have read that in many parts of Russia large sheets of talc are substituted for glass in windows.

MRS. C.

And in the Province of Yakutsk, in Siberia, the inhabitants sometimes cut large blocks of ice, the size of the window frames, which they put in and let them freeze fast. These serve them the winter through; and though they give rather an opaque kind of light, they are perfectly tight and warm, and remain unthawed until the spring.†

* Herschel's Preliminary Discourse.

† Dobell's Travels in Kamschatka.

HENRIETTA.

Then how very cold it must be there.

MRS. C.

Yes; Yakutsk is the coldest part of Siberia—the thermometer sometimes stands there at 44° below the zero of Reaumur's thermometer.

MRS. F.

Which, by our recent mode of calculation, is equal to 67° below the freezing point of Fahrenheit.

MRS. C.

The accounts of the value of glass among the ancients is very contradictory. That it was in frequent use, we see from the number of glass cups, plates, bottles, &c., which have been found in Pompeii, some of blue, green, and yellow glass; and also from the paintings of fruit, eggs, &c., in glass vessels, which adorned the walls of the rooms. That their windows also were glazed, appears from the leaden or brass divisions to the window frames in some of the houses, and in one, a pane of glass yet remains. When windows of glass became common, it is difficult to say. A writer accuses an individual of luxury in having glass windows in the time of Aurelian; and yet Caligula, when giving audience to Philo, a rich Jew of Alexandria, is stated to have attended to nothing but to the new glazing of his windows, so that the imperial palace must have been glazed long before, to have required renewing.*

ESTHER.

Did not the ancients know how to render glass malleable?

MRS. C.

So we are told; and Tiberius is said to have beheaded its inventor. An Arabian writer speaks of the malleability of glass as known to the Egyptians—who were certainly well acquainted with the manufacture of glass, as the objects dis-

* Sir William Gell.

covered in their tombs testify. A ball of glass has been found, bearing the date of an Egyptian king who lived about 1500 years before the Christian era. It has a slight greenish hue, and has been worn as the bead of a necklace. The Egyptians also understood the art of carrying devices of various colors directly through the fused substance, an art which is now lost.* But it appears that the Egyptians carried the manufacture of glass, vitrified porcelain, &c., to great perfection; and every thing that we can do by the application of fire in these arts, they were also able to effect.†

MRS. F.

The old Venetian glass has patterns or devices introduced into the substance with fine filaments of spun glass, which gives the appearance of lace work; this is an art which I believe is lost, and the old Venetian glass is much prized and sought after. The manufacture of the glass beads still exists, and gives employment to some hundreds of persons.

MRS. C.

Did you see it?

MRS. F.

Yes; when we were at Venice, we made an excursion to the Isle of Murano, where the manufacture is carried on. The glass is drawn out into sticks of the intended diameter of the bead, but a hundred and twenty feet long. These are then cut, polished, and rounded. The process employed in these operations is very simple, but curious; and the manufacturers profess to keep the mixing of the colors, &c. in the glass a profound secret. Looking-glasses are also manufactured in the same island; but France and England have so far surpassed the Venetians in this art, that they cannot attempt to compete with them.

HENRIETTA.

How long have glass windows been introduced into England?

* See Mr. Wilkinson's Thebes.

† Cuyier.

MRS. F.

In church windows, they have been used for upwards of a thousand years, but glazed windows in dwelling-houses were rare even in the time of Henry VIII. They were then moveable furniture; and we read so late as the reign of Queen Elizabeth, that when the Earl of Northumberland left Alnwick Castle, in 1573, the windows were taken out of their frames, and laid carefully by. But, talking of glass, I conclude that you are all familiar with the account of the first discovery of glass?

HENRIETTA.

About the merchants who were wrecked with a cargo of nitre, upon the coast of Palestine, near the river Belus, and who supported their kettles with the blocks of nitre, which, combining with the sand, produced glass?

MRS. F.

Exactly so. Whether the account be fabulous or not, there is little doubt but that its first discovery is to be attributed to accident.

ESTHER.

Is sand much used now in making glass?

MRS. F.

Generally; but in glass for artificial stones powdered rock crystal is usually employed in preference; flints and the white quartz pebbles found in rivers are also sometimes used.

ESTHER.

The sand of Alum Bay, in the Isle of Wight, is particularly white, and is much employed in the making of glass.

MRS. C.

And so is that in the vast sand caverns at Reigate.

MRS. F.

I never heard of them, though I have often passed through that town, in my way to Brighton.

MRS. C.

Then I would recommend you to visit them the next time you go that road, for they are interesting from their historical associations, as well as from their being natural curiosities.

ESTHER.

Pray, have the kindness to describe them to us.

MRS. C.

The entrance is upon the top of a hill which overlooks the town, and on which formerly stood a strong castle. The cave is about 200 feet long, and is excavated out of the sand. It contains one branching vault near the centre, called the Barons' Cave, which tradition has rendered famous by asserting that it was there that the Barons held their secret meetings, and drew up the terms which they afterwards compelled John to accept at Runnymede.

ESTHER.

How large is the Barons' Cave?

MRS. C.

About a hundred and fifty feet long, twelve wide, and from ten to twelve high.* It is supposed to have been originally excavated as a retreat, at the time of the invasion of the Danes. There is also another cavern in the lower part of the town, near an inn: but in this the sand is left in columns to support it, and the high road runs over it. Here the people amuse themselves in the winter, by playing nine-pins, &c.; and the sand is dug out for the London markets, and constitutes an object of some traffic.

MRS. F.

Thank you, Mrs. Clifford; we will certainly visit the Barons' Cave the first opportunity.

MRS. C.

Now that we are on the subject of glass, can any of your

* Conybeare and Phillips' Geology.

young people tell me the difference between barilla and kelp?

ESTHER.

I fear not; but we must ask you to explain it.

MRS. C.

They are both, as you know, alkalis, and produce soda. Barilla is the ash of the plant *Salsola Soda*, which is largely cultivated upon the Mediterranean shore of Spain, in the vicinity of Alicant.* Kelp is a production of Great Britain, and consists of the ashes of sea-weeds, which are collected upon many of the rocky coasts of Britain, particularly in the Highlands, where it affords employment to a large population.

ESTHER.

It is produced from a species of Tangle or Fucus, is it not?



Ulvæ and Fuci.

MRS. C.

There are four species which are principally used—*Fucus*

* As much as fifty-five per cent. of soda is contained in the ashes of *Salsola sativa*, which grows in Sicily. (Lindley.)

serratus, *digitatus*, *nodosus*, and *vesiculosus*, which are the hardest of the tribe; *nodosus* being the most thick and coriaceous of the *Fuci*, is most preferred, and next *vesiculosus*, which is very abundant. The kelp harvest takes place in June, July, and August. The drift-weed, which is thrown on shore, is sometimes used, but never, if injured, as in that state it contains but little salt. The *Fuci* are cut with a sickle at low water from the rocks upon which they grow, and are brought to the shore by a very simple and ingenious process. A rope of heath or birch is laid beyond them, and the ends being carried up above high-water mark, the whole floats as the tide rises; and thus by shortening the rope, the *Fucus* is compelled to settle above the wash of the sea, when it is conveyed to dry land on horseback. The more quickly it is dried the better is the produce. It is burnt in kilns, or merely in holes excavated in the earth, or surrounded with stones. In the Orkneys the holes of earth are preferred. When I tell you that 24 tons of sea-weed only produce one ton of kelp, you will easily understand how the cutting, landing, carrying, drying, stacking, and burning the weed are the source of employment to so many poor people; but, since the admission of foreign barilla this manufacture has nearly died away, and a numerous class of poor and industrious persons have thus been thrown out of employ.*

MRS. F.

Do they cut the same plants annually?

MRS. C.

No; only every second or third year. But, independent of their use for kelp, the different species of *Fuci* are of the greatest utility. *Fucus vesiculosus* is frequently used in the West Highlands and islands of Scotland, as food for cattle, who regularly come down to the sea-shore, at the receding of the tide, to seek for it†; and even the deer have been known

* M'Culloch's Highlands, and Brande's Chemistry.

† Cattle are also very fond of *Fucus canaliculatus*, and never fail to browse upon it in winter, as soon as the tide leaves it within their reach.

to descend from the mountains to the sea-side to feed upon this plant. Linnæus tells us, that the inhabitants of Gothland boil this plant in water, and mix it with meal to feed their pigs; and in Scania they cover their cottages with it, and use it for fuel. In Jura and some other Hebrides, they dry their cheeses without salt, by covering them with the ashes of this plant.*

MRS. F.

Fucus serratus is used for most of the same purposes, and also for manure; and in the Isle of Thanet, the farmers carefully collect the sea-weed, which, after a gale of wind, is sometimes thrown upon the shore. It is carted through sloping passages cut in the cliff; and it sometimes comes in quantities amounting to many thousands of loads, which the succeeding tide often sweeps entirely away, if not expeditiously gathered up. You know also that *iodine*, which has been so successfully used in curing goitres, is derived from the marine Algæ; and we are informed that in South America, the stem of a *Fucus* had been successfully applied to the same purpose, long before iodine was employed in Europe.

ESTHER.

Then there is the sea-weed which the companions of Columbus were so alarmed in finding in such quantities.

MRS. C.

That is *Fucus natans*, which covers the sea in the vicinity of the Cape Verd Islands, and the floating masses of which are so abundant, in the seas of warmer climates, as to impede the progress of the vessels.

ESTHER.

Are not the Fuci generally, called *wrack*.

MRS. F.

Yes; the term which is derived from their French denomi-

* Hooker, in vol. v. of English Flora.

nation, *varec*. The one which we have been just alluding to is often called the *Gulf-weed*.

MRS. C.

The *Algæ*, the order to which the Fuci belong, afford many other interesting plants. *Fucus tenax*, which, though a small plant, is collected in such large quantities, that 27,000 lbs. are annually imported at Canton, where it is used for the same purpose that we employ glue and gum. The Chinese chiefly use it in the manufacture of lanterns, to strengthen or varnish the paper, and sometimes to thicken or give a gloss to their silks and gauzes.* The *Laminariæ*, in which the inhabitants of New Holland find materials for instruments† and for vases‡ to hold water, and which they also eat as food.§ Those of the polar regions yield nourishment in time of famine; and *Laminaria digitata* was consecrated to the sorcerers in Iceland, Norway, and the North of Scotland.

MRS. C.

The last you mention, is the Tangle of the Scotch, and is called by us Sea Girdles.

MRS. F.

Fucus crispus,|| which is abundant on rocky shores, has been extensively collected on the coast of Ireland, washed, bleached upon the beach, and employed as a substitute for isin-glass in making blanc mange, &c. Then there is the Dulse (*Halymenia palmata*,) which we have all often gathered and eaten. This is the saccharine *Fucus*, which is dried in Iceland, packed down in casks, and used as occasion requires. It is also a great favorite with cattle, and sheep in particular eat this species with great eagerness. The Scotch eat it in a crude state, and also dried and rolled up, when they use it as tobacco.¶

* Lindley.

§ *L. saccharina* and *esculenta*.

† *L. buccinalis*.

|| *Chondrus* genus of Hooker.

‡ *L. potatorum*.

¶ Hooker's English Flora, vol. v. p. 291.

ESTHER.

Does not Laver also belong to the order *Algæ*?

MRS. C.

Yes; there are several species of it which are eaten.* But there still remains another interesting genus in this order, the *Gelidium*, which serve as nourishment to several Asiatic nations, who use them to thicken their sauces and to moderate the burning of their spices. With a species of *Gelidium*, the salangane or Chinese swallow (*Hirundo esculentus*) builds its highly esteemed nest. As we are on the subject, suppose we read the interesting account of this little bird, in the 9th volume of the Library of Entertaining Knowledge.

(The book was taken down and the extract read.)

MRS. C.

There is one piece of information which I can add to the account which we have just read; and that is the mode in which the Chinese prepare their bird's-nest soup.

HENRIETTA.

We should like very much to hear it.

MRS. C.

The soup is served up with pigeons' or plovers' eggs floating on it. It is made into a very strong broth, by boiling and consuming the pounded flesh of fowls, a portion of which remains in it. There being neither salt nor pepper in the preparation of this dish, it would be quite insipid were it not for vinegar and soy, which you use at pleasure.†

ESTHER.

I have heard all kinds of strange stories about Soy, and should like very much to know what it is really made of.

MRS. C.

Soy is made from a species of *Dolichos* (*D. Soja*). These

* *Ulva lactuca*, *latissima*, *Porphyra laciniata*, *vulgaris*, &c.

† Dobell's *Kamschatka*.

beans are boiled until all the water is nearly evaporated, and they begin to burn, when they are taken from the fire and placed in large wide-mouthed jars, exposed to the sun and air; water and a certain proportion of molasses or very brown sugar are added. These jars are stirred well every day, until the liquor and beans are completely mixed and fermented; the material is then strained, salted, and boiled, and skimmed until clarified, and will, after this process, become of a very deep brown color, and keep any length of time. Many persons have thought that gravy was used in preparing this condiment; but this appears not to be the case, the composition being entirely a vegetable one, of an agreeable flavor, and said to be wholesome. There are two or three qualities of soy. To make the best, requires much care and attention. Japanese soy is much esteemed in China, on account of the superior manner in which it is made; perhaps, they have a different species of bean for the purpose. Shopkeepers at Canton who sell soy have large platforms on the roofs of their houses, where the jars for preparing soy are arranged and exposed to the sun, for the consumption of soy is enormous. Neither rich nor poor can breakfast, dine or sup without it; it is the sauce for all kinds of food, gives a zest to every dish and may be said to be indispensable at a Chinese repast.*

MRS. F.

Thank you, Mrs. Clifford. I think that we must now return home.

MRS. C.

But before we leave our conversation upon the Algæ, we must mention the celebrated red snow of the northern travelers, which is a production of a genus of this order—*Protococcus nivalis*. In Great Britain it is found in the form of a thin stratum on the surface of rocks, or investing decayed vegetable substances with a purple crust. It was brought by Capt. Ross from the Arctic regions, where it was observed covering the surface of the snow, in patches of many miles

* Dobell.

in extent, and penetrating, in some places, to the depth of twelve feet. It has likewise been found to occur commonly, on most of the mountains of Europe, in similar situations.*

MRS. F.

I think we have now enumerated a long list of useful individuals in this subordinate class of plants, and, at some other time, we will go into the other orders of Cryptogamia. In all, we shall find plants of the greatest service to man; and indeed, in all our researches, we may rest assured that not even the lowest object in the scale of creation, or the minutest lichen which covers the arid rock, was ever made in vain. But the carriage is come, so we will wish Mrs. Clifford good night, and offer her our best thanks for the gratification and instruction which she has afforded us.

* Hooker.

CHAPTER VI.

ITALIAN MANUFACTURES.

SPARTERIE. — LEGHORN HATS. — MODE OF CULTIVATING AND PREPARING THE STRAW. — MANUFACTORY AT BENENDEN. — PIETRA DURA. — MEDICI CHAPEL. — ROMAN MOSAIC. — ROMAN PEARLS. — ARGENTINE. — LEVITICAL PROHIBITIONS WITH REGARD TO FISH. — JEWS IN ROME. — CEREMONY OF THE RENEWAL OF THEIR PERMISSION TO REMAIN IN ROME. — FINAL RESTORATION OF THE JEWS.

HENRIETTA.

AUNT, will you have the kindness to tell me of what your hat is made? I see that it is neither of straw nor willow.

MRS. F.

It is of the material usually called "Sparterie," a term which originated in its being first made of the grass called *Lygeum Spartum*; but now, I believe, that many other substances are employed. Mine is made of the poplar, which is cut into very thin slices for that purpose.

ESTHER.

What is the reason, mamma, that Dunstable straw is considered so superior to any other?

MRS. F.

This superiority is generally attributed to the straw being grown upon a chalky soil, which makes it finer in color and more pliant than that which is grown upon clay or sand; but, independent of the superior fineness of the Italian straw, the British manufacturer will never be able to compete with the foreign, in consequence of the cheapness of labor upon the

Continent. Hertfordshire straw has actually been sent to Switzerland, plaited in that country, and returned to England, where, notwithstanding the import duty of seventeen shillings a pound, it can be sold at one quarter less price than plait made at home.*

ESTHER.

And pray, mamma, of what straw are the Leghorn hats made?

MRS. F.

Of wheat straw; but, as the universal employment of Leghorn hats renders their manufacture an object of some interest, suppose we devote our conversation this morning to the subject?

FREDERICK.

Thank you, aunt.

MRS. F.

These hats are called Leghorn, because it is from this port that they are principally sent to England; but they are made in most parts of Tuscany; and in traversing the Val d'Arno, in the road from Pisa to Florence, we saw the peasants sitting at their doors plaiting the straw, which seemed to form the principal occupation of the country. The wheat, in order to bring the straw to the requisite degree of fineness, is submitted to a peculiar mode of cultivation. The poorest, lightest, and most sandy soil is selected, and if it be an elevated land, and full of stones and pebbles, it will answer the better, and produce the finer straw; for, you must recollect, that the object in view is directly in opposition to that which we usually strive to attain. Instead of producing a fine, vigorous plant, the aim is to render it as weakly, as thin, and producing as little grain as possible. The land, therefore, is but slightly prepared for its reception; the corn is sown very thickly, to crowd the plants closely together. It is usually sown

* Transactions of the Society of Arts.

in autumn in preference to the spring, because then the plant sooner arrives at maturity, and the whole of the succeeding summer is before the manufacturer for bleaching and preparing the straw. As soon as the stalk has attained sufficient strength, it is gathered.

ESTHER.

Do not they wait until the corn is ripe?

MRS. F.

The grain is suffered to form, but not to ripen, except upon those stalks which are reserved for seed, and these are employed for hats of an inferior quality. The wheat is pulled up by the roots, in order to procure the stalk as long as possible, and is laid in small bundles to be exposed for four or five days to the sun. The dew assists the bleaching, but rain spoils the color; once wetted, it loses all its whiteness, and can never be used for the finest hats.

HENRIETTA.

Is the whole of the stalk used?

MRS. F.

Only that part which extends from the first knot in the stalk to the ear. When it has been sufficiently exposed to the heat of the sun, the straw is placed in a large wooden box with a chafing-dish in the centre. Care is taken that no metal whatever is employed in the construction of the box, which is then hermetically closed, and the straw is thus exposed to the heat for three or four days. It is then sorted according to its different qualities; and so nice are the manufacturers in their distinctions, that sometimes as many as sixty heaps will be selected from one box, each differing from the other in whiteness or quality. Plaiting is the next operation; the plait is begun with five straws, and gradually increased to nine, until the crown of the hat is completed. The sewing of the hats so as to make the needle pass between the different straws is not a difficult process. When the hats are finished, they are bleached, polished, and calendered,

being exposed to the fumes of sulphur from one to three days, in the same case in which they were bleached. The discolored straws are then taken out with a needle and scissors, and the vacancies supplied by others. The hats are polished with little pieces of boxwood in the form of a shuttle, with which they rub them always in the same direction, and a long hot iron of about 15lbs. weight is employed for the calendering process.

ESTHER.

It is by the number of the rows of plait that the fineness of a hat is known, is it not?

MRS. F.

Yes; you will always see a pencil figure in the bottom of a Leghorn hat, which denotes its quality.

HENRIETTA.

What becomes of the inferior straw hats?

MRS. F.

They are generally dyed black, and worn by the country-women themselves. The women about Florence wear round black hats with bunches of feathers in them; and I confess the effect was rather curious to my eyes, when the washer-woman who called for our clothes, entered the room drest in a round black hat with three feathers: it was probably these round black hats which made me fancy that the Florentines resemble the Welsh women in their appearance; added to which they are short and rather stout, with clear florid complexions, and well looking. But before we finish the subject of Tuscan hats, I must tell you that there is a manufactory of them in England, where they are produced little inferior in quality to the originals.

HENRIETTA.

Oh! where, aunt?

MRS. F.

In the village of Benenden, in Kent, where it has been

established for some years, through the exertions of one of the Members for the county.

HENRIETTA.

But where did he get the straw?

MRS. F.

Being familiar with its mode of cultivation in Tuscany, he pursued the same method for its production here. The inferior seed (what is usually denominated *tail wheat*) was sown very thickly (20 bushels to the acre) upon the most barren soil, and the straw produced, is hardly inferior to the Tuscan.* By unpicking a Leghorn hat, the plait was ascertained, and was first taught to a poor crippled pauper in the workhouse, who instructed the children in the same art, until a school was gradually formed. A hat was exhibited at the Society of Arts some years since, and was rewarded with a medal; and since then the demand for these hats has so rapidly increased as to afford the means of occupation to a considerable number of persons. Thus have the benevolent exertions of its founder been crowned with success; and thus should we all endeavor, when acquiring knowledge ourselves, to turn it to its only true account — that of promoting the welfare and best interests of our fellow creatures.

HENRIETTA.

Aunt, you say that you were once at Florence; did you see the Mosaic work there?

MRS. F.

The *pietra dura* manufactory, you mean: yes; I saw it among the other objects of curiosity in Florence, and was much interested in the exhibition. The establishment belongs to the Grand Duke, and works only for him. We went into a large gallery which had cabinets around it, all filled with agates and other fine stones employed in the work. There

* At Benenden the process of sorting the straws is effected by passing them through wire sieves of different degrees of fineness.

are only eighteen or twenty workmen. The stones are all cut with a wire and emery powder, and are cemented in the spaces allotted to them with a composition of wax, turpentine, &c.; but so tedious is the work, that one of the men showed me a little piece of inlaying, not two inches square, which had taken four months to accomplish. The artists are principally employed in works for the Medici Chapel, which was begun by Ferdinand I, in 1604, and which the present Grand Duke is anxious to complete.

ESTHER.

I suppose it is very magnificent.

MRS. F.

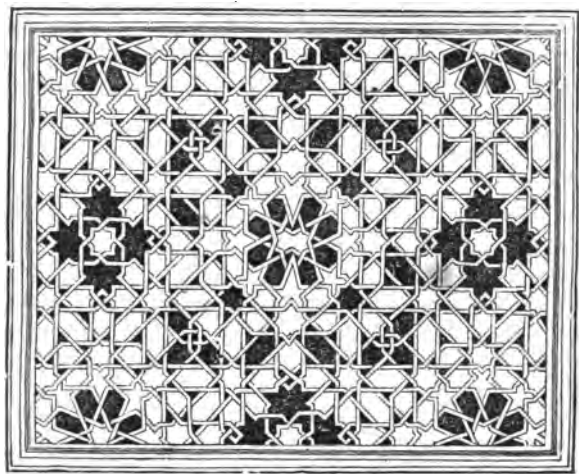
Yes; it is lined with all the richest varieties of jaspers, marbles, &c. Its form is octagon: six sides are ornamented with magnificent sarcophagi of Egyptian granite,* and round it are the armorial bearings of sixteen Tuscan cities,† most exquisitely executed in lapis lazuli, mother-o'-pearl, oriental alabaster, and all the most precious stones — the name of each city being inscribed in lapis lazuli upon tablets of *giallo antico*. The grandeur of this chapel forms a singular contrast to the simplicity of the tomb of the great founder of the family. He is buried in the church of St. Lorenzo: a pavement of porphyry, serpentine, and other marbles covers the tomb, upon which is inscribed, "Here lies Cosmo de' Medici, surnamed by a public decree, the Father of his Country. He lived 75 years 3 months and 20 days." Such a modest epitaph on the tomb of so great a man, speaks more forcibly to the feelings than the luxury and ornament bestowed upon those of his less glorious posterity.

* The bodies lie in a repository beneath, but the sarcophagi are inscribed to the memory of the six first reigning dukes of the Medici family, — Cosmo I, died 1574 — Francis, 1587 — Ferdinand I, 1609 — Cosmo II, 1620 — Ferdinand II, 1670, — and Cosmo III, 1723.

† Sienna, Fiesole, Firenze, Pisa, Pistoja, Arezzo, Volterra, Cortona, San Sepolero, Montepulciano, Pienza, Chiusi, Soana, Montalcino, Massa, Grosseto; and the arms of the Medici.

HENRIETTA.

Did you see the Roman Mosaic, aunt?



Mosaic Pavement.

MRS. F.

Yes; we visited the principal manufactory of it in the Vatican. The patience required in this art is unbounded. The number of shades of glass which are employed, amount to above 18,000, and, by means of these, the coloring of a painting is imitated with the greatest accuracy. The establishment in the Vatican is solely employed in copying paintings for the decoration of St. Peter's.

ESTHER.

But, after all, these mosaics must be very inferior to paintings.

MRS. F.

True; and, compared with them, they must always hold a very inferior rank in art; but then, mosaic possesses the ad-

vantage of being uninjured by damp, time, and all the various causes by which painting is destroyed; and when we view the magnificent copies of the old masters which decorate St. Peter's, we cannot but value an art by which so many fine works are perpetuated, which otherwise would be lost to succeeding ages.

HENRIETTA.

In what manner do they work at it?

MRS. F.

A slab of marble or stone is taken, out of which the artist cuts the space which he intends to fill, and encircles it, for strength, with bands of iron. He then covers this space with a thick layer of mastic, in which he places his pieces of glass, according to the design which he is copying. When the subject is finished, it is all ground down to a level surface, and then polished.

ESTHER.

I suppose, mamma, when you were at Rome, you saw the Roman pearls made.

MRS. F.

Yes; for I always make a point of seeing the manufactures of every country which I visit. The Roman pearls differ in their composition from those made in France, the latter being glass beads filled with wax and coated with the silvery substance obtained from the scales of the Bleak (*Cyprinus alburnus*).

HENRIETTA.

Then how are the Roman pearls made?

MRS. F.

They are formed of the purest alabaster, which comes principally from the neighborhood of Pisa. The alabaster is sawn into slices, the thickness of which is equal to the intended diameter of the pearl. The pearl is then made by an instrument which works something on the principle of the

tool called by our carpenters a centre-bit. This tool pierces a hole through the alabaster, and cuts half its thickness into the shape of a hemisphere: the hole in the centre directs where the instrument should be placed on the other side of the slice of alabaster; and by performing the same operation the sphere is completed; and the bead formed with a hole through it. The beads are then strung, and rubbed with fish skin in order to remove their inequalities: each bead is next placed upon a separate pin and dipped into wax, in order to give it a yellowish hue; and afterwards they are dipped into the silvery liquid which is procured from the air bladder of the Argentine,* a little fish which is common in the Mediterranean. These pearls have the advantage of being less fragile than those of glass,—indeed, they may be dashed upon the ground without receiving the slightest injury; and their color, also, is less likely to change than those in which the wax remains exposed to the influence of the atmosphere.

MARY.

Did you ever see the fish from which they are made, mamma?

MRS. F.

Frequently; for we often had them for dinner at Rome; and so charged are their air bladders with this pearly substance, that in rubbing it between our fingers they were perfectly coated with silver. This fish is much in request among the Jews at Rome, who are forbidden, you know, by the Levitical law,† to eat fish that have no scales; and they therefore never touch eels, sepia, or other scaleless fish, which are eaten by the Italians.

ESTHER.

Are there many Jews living at Rome?

MRS. F.

Yes a great number; and they have one particular part of

* *Argentina sphyæna*.

† Leviticus, chap. xi. ver. 9—12. With the ancient Romans it was not lawful to use fish without scales at the feasts of the gods.

the city, where alone they are permitted to dwell.* No Jew is allowed to be a householder in Rome; but their permission to remain in the city is renewed every year, upon the payment of an annual tribute. The ceremony attendant on this grant is very curious, and I was so fortunate as to be a witness to it the last time I was in Rome.

HENRIETTA.

Pray, aunt, tell us all about it.

MRS. F.

The form is this, as nearly as I could gain from what I saw, and from the answers given to my inquiries, as I was never able to find any published account of the ceremony.—A herald from the Roman Government goes to the quarter of the Jews eight-and-forty hours before the commencement of the Carnival, and orders them to leave Rome in four and twenty hours. The Jews send three of their Rabbi to the authorities, to ask if any thing can be done, on their part, to revoke the mandate. They are told *to try*. The three Rabbi then go to the Palazzo de' Conservatori, in the Capitol, where they are received by three of the Conservatori to hear their proposals. The Rabbi present to them, kneeling, a large nosegay of flowers, in which is enclosed a draft for the sum appointed as a tribute. The chief Conservator takes it and tells them they shall hear further about it, and dismisses them with the word "*Andat*," accompanied by a kick with his foot. The Conservatori then carry the Jews' nosegay to the chief Senator of Rome, before whom the deputation is next summoned. He signifies to the Rabbi that their proposals are accepted, and that the Jews will be permitted to remain in Rome another year. They are then dismissed; the chief Senator orders the great bell of the Capitol to be rung, to announce that the Carnival has begun; and parades the Corso and the other principal streets of the city in his carriage of state, accompanied by the Conservatori, and the other

* As they formerly were restricted in London to the Old Jewry.

chief officers of Rome. The Jews, in addition to this tribute, are required to pay for all the flags used in the horse races in the carnival, and also to furnish money for the prizes which are given; these prizes being as an exemption from the indignities to which they were formerly exposed, when they were compelled to run through the Corso, on the first day of the carnival, for the amusement of the people, who assailed them with every kind of offensive missile in the most barbarous manner. So late as to the period of the French dominion, when this ceremony of the humiliation of the Jews was performed, the chief Conservator used to place his foot upon the neck of the chief Rabbin, who was obliged to prostrate himself before him; and then, when the Conservator uttered the word "Andat," he spurned away the Rabbin with a kick.—The French abolished the whole ceremony, but Pius VII was obliged, on his return, to restore it, though with great reluctance; but he caused the ignominious practice of placing the foot upon the Rabbin's neck to be abolished. Recent arrangements have also led to the discontinuance of the kick of dismissal; and when I witnessed the ceremony, it was no longer given. Let us hope that succeeding years will see the whole ceremony abolished, and that the time for the persecution of this devoted race is fast drawing to a close.

ESTHER.

I always feel the deepest interest in reading about the Jews.

MRS. F.

And so we ought. Moses, indeed, was permitted to look in the glass of ages when he foretold so minutely what has happened to this people for now above 3200 years—the destruction of their city and their temple—their country ravaged—their selves falling before the sword, the famine, and the pestilence—dispirited, persecuted, enslaved—driven from their own land, "dispersed among all nations, left to the mercy of a world that every where hated and oppressed them—shattered in pieces like the wreck of a vessel in a mighty

storm—scattered over the earth, like fragments on the waters, and, instead of disappearing or mingling with the nations, remaining a perfectly distinct people, in every kingdom the same, retaining similar habits and customs in every part of the globe—meeting every where the same insult, mockery, and oppression—finding no resting place without an enemy soon to dispossess them—multiplying amidst all their miseries—surviving their enemies*—beholding unchanged, the extinction of many nations, and the convulsions of all—robbed of their silver and of their gold, though cleaving to the love of them still, as the stumbling block of their iniquity—often bereaved of their very children—disjoined and disorganised, but uniform and unaltered—ever bruised, but never broken—weak, fearful, sorrowful, and afflicted—often driven to madness at the spectacle of their own misery—taken up in the lips of the talkers—the taunt and hissing and infamy of all people, and continuing ever, what they are to this day, the sole proverb common to the whole world.”† Such a chain of prophecy already fulfilled, we may look to the completion of all; how far the agency of man is bringing about the designs of the Almighty, we can neither see nor determine—but the growing importance of this outcast race is daily increasing. The time for their persecution is passed—their civil disabilities are gradually being removed. Inheriting the “riches of the Gentiles,” the influence which they extend by their “silver and gold” may be an instrument towards their restoration. We cannot tell how far the use of human means may be continued to be employed in working out the fulfilment of prophecy. It is not for mortal men to determine the counsels of God; but we may rest assured that the promise made to Abraham will be fulfilled, and, that succeeding ages will see “the outcasts of Israel gathered together from the four corners of the earth,” and brought into the land which their fathers possessed. Then shall they be

* The Egyptian, Assyrian, Babylonian, and Roman Empires have disappeared; the Persians alone, who restored them from the Babylonish captivity, yet remain a kingdom.

† Keith's Evidence of Prophecy.

"raised up as an ensign among the nations" — their "wastes shall be builded" — their cities inhabited — they shall be no more a reproach among the people — they shall be planted in their own land, and shall repair the "desolations of many generations."*

* See Deuteronomy, Isaiah, Ezekiel, and all the other prophets.

CHAPTER VII.*

ON SOUND.

SOUND. — BELL IN EXHAUSTED RECEIVER. — SILENCE IN ELEVATED PARTS OF GLOBE. — PISTOL ON MONT BLANC. — METEORS. — DIFFERENT VELOCITY OF SOUND IN DIFFERENT BODIES. — EXPERIMENT OF THE CRACKED GLASS AND CHAMPAGNE. — SOUNDS AT NIGHT. — ILLUSTRATION OF THE MIRAGE. — ICE A CONDUCTOR OF SOUND. — SEA FIGHTS. — SPEAKING PIPES. — WELL AT CARISBROOK. — CAST-IRON PIPES AT PARIS. — NEW BELL. — ECHO AT GIRGENTI. — SOUND CONVEYED BY WATER. — ALONG WOOD, WIRE, ETC. — VENTRILOQUISM. — SENSIBILITY OF THE HUMAN EAR. — EAR OF DIONYSIUS. — STATUE OF MEMNON. — MUSICAL ROCKS. — SCIENTIFIC KNOWLEDGE OF THE ANCIENT PRIESTS.

HENRIETTA.

AUNT, I have been calling to Mary these last ten minutes, to tell her to come in, as it rains, but she will not answer me.

MRS. F.

Are you quite sure that she hears you?

HENRIETTA.

Perfectly so; for the other morning she heard me very well though she was much farther down the garden.

MRS. F.

But perhaps it did not rain then.

HENRIETTA.

No, it did not; but what difference would that make?

* The first part of this chapter is chiefly taken from the review of Herschel's Treatise, in vol. xlv. of the Quarterly Review.

MRS. F.

Send an umbrella to Mary, and when she arrives I will explain it to you.

In a few minutes Mary returned, and, the party being seated, Mrs. Fortescue began her promised conversation, by asking who could tell what is the vehicle by which sounds are commonly conveyed.

HENRIETTA.

The air, I suppose.

MRS. F.

It is by the air, certainly, that sounds are conveyed; but this important fact was not established until the beginning of the last century.

ESTHER.

And how was it then ascertained?

MRS. F.

By the simple experiment of suspending a bell in a glass vessel; as the air was gradually drawn out, the sound became fainter and fainter, until the vessel was completely exhausted, when the sound could no longer be heard. Upon re-admitting the air, the sound was, of course, again heard; and on forcing more air into the vessel than is equal to the atmospheric pressure, the loudness of the sound increased in like proportion.

ESTHER.

Then now I understand why such a deep silence appears to reign in the elevated parts of the globe. All travellers who have ascended to any considerable height, speak of the universal stillness which pervades.

FREDERICK.

How does my aunt's experiment account for that?

ESTHER.

In this manner; — because the higher we ascend, the rarer

and more pure the air, and, consequently, all sound becomes much enfeebled; for, as we have already seen, the denser the air, the louder the sound, and *vice versa* — if there were no air, nature would be buried in the deepest silence.

MRS. F.

De Saussure found, at the top of Mont Blanc, that the report of a pistol was no louder than a cracker.

HENRIETTA.

Then, I suppose, if we were to ascend much higher, sound would not be heard at all?

MRS. F.

Yes, it would; for, recollect, so long as *air exists*, sound can be conveyed. Although very much weakened at such elevations, yet it is very evident that at heights, where the air must be 3000 times rarer than on our earth, sounds are still transmitted.

ESTHER.

How can that be determined?

MRS. F.

From the sound of meteors having been propagated down to the earth. The meteor of 1714, whose height when it passed across Italy was at least 38 miles, made a hissing noise, like that of fireworks; and, at Leghorn, gave a loud report, like that of a cannon.

FREDERICK.

I beg your pardon for interrupting you, aunt; but how could the distance of a meteor be calculated?

MRS. F.

By computing the interval of time between the appearance of its explosion in the air, and the time that the sound arrives at the ear. If a gun be discharged at a distance, you know that the flash precedes the report by some seconds; and so lightning always precedes thunder. Now, as we know the

rate at which sound travels, by observing the number of seconds which intervene between the flash and the report, we can always determine the distance.

FREDERICK.

At what rate is sound conducted?

MRS. F.

Eleven hundred feet a second may be estimated as a fair average, but this rate supposes the atmosphere to be perfectly calm. If there be wind, the velocity of the wind must be *added* to the velocity already mentioned, if the wind blows from the sounding body to the ear; or must be *subtracted*, if it blows in a contrary direction.

But, to return to meteors. One which appeared five years after that which I have just mentioned, emitted much louder sounds, which in Devonshire and Cornwall resembled that of a cannon; and the air experienced so violent a concussion, as to shake the windows and doors, and even to throw a looking-glass out of its frame and break it; and these effects were the result of an explosion which took place sixty-seven miles above the earth. With respect to the point which gave rise to this conversation, what prevented Mary from hearing Henrietta call her to-day, although, at another time, she heard her, at a greater distance, perfectly well? The reason is this; that sound, as light, is but imperfectly transmitted through mixed media. Fog, falling rain, or snow, all therefore obstruct its progress; for sound moves in different velocities in different bodies. When the medium through which sound or light passes is of the same density, the sound or light will be transmitted with the least loss and the greatest distinctness; but, if the medium has different densities, or consists of different bodies imperfectly mixed, or is interrupted by empty spaces, the light or sound will be either greatly diminished or entirely destroyed. This effect, in the case of light, may be seen if we look through a piece of cracked glass; or if we add syrup to water in a glass, and, before they have quite combined, hold up the glass to a candle, the candle will

appear like a cloud; and the same effect applies precisely to sound. Therefore, if the two media are of different characters, the one a gas, the other a fluid, as in the case of falling rain; or the one a gas, and the other a solid, as in the case of falling or new-fallen snow; the scattering and deadening of the sound will be still more complete.

ESTHER.

I can tell you of an experiment which will show you this very clearly.

FREDERICK.

What is it?

ESTHER.

If a tall glass be half filled with sparkling champagne, or any other fermented liquid, the glass cannot be made to ring, by a stroke upon its edge, so long as the effervescence continues, and while the wine is filled with air bubbles; but, as the effervescence subsides, the sound gradually becomes clearer and clearer, until, at last, when the air bubbles have disappeared, the glass rings as usual.

HENRIETTA.

Let us try this at dinner to-day.

MRS. F.

Humboldt has employed this interesting experiment to explain the well-known phenomenon of distant sounds being heard more distinctly at night than at day.

ESTHER.

In what manner?

MRS. F.

In a hot day, when warm currents ascend from the heated ground, and mix with the cold air above, of a different density, the atmosphere is a mixed medium, as in the case of the glass of champagne.

ESTHER.

And also as in that of the syrup and water; for the transparency of the air, in a hot day, is much affected, and every object appears, as it were, in motion.

MRS. F.

At midnight, on the contrary, the air is transparent and of a uniform density, and more fit to transmit sounds to the ear without any interruption.

ESTHER.

The syrup and water is a good illustration of the *mirage* of the desert.

MRS. F.

Yes; but, I presume that you are all well acquainted with this phenomenon and its causes, and, as I have already observed, the points of resemblance between the nature of light and sound are numerous; but, I was telling you that falling or new-fallen snow obstructs sound; the very opposite effect is produced by hardened snow, water, or ice. Of this, I can give you some curious examples.

HENRIETTA.

Pray do.

MRS. F.

Lieutenant Forster conversed with a man across the ice of Port Bowen, harbour, a distance of about a mile and a quarter; and Major Denham gives his authority, that the human voice was heard at Gibraltar, at a distance of ten miles. When the ground is dry and hard, or rests upon a continuous stratum of rock, sound is propagated to a much greater distance: hence the practice in many countries of ascertaining the approach of horsemen by applying the ear to the ground. The sound of cannon has been heard at distances of 120 to 200 miles.

MARY.

Oh! mamma, that is far indeed; when did it happen?

MRS. F.

It is stated upon the authority of Doctor Clark, who heard the sound of a sea-fight at a distance of 130 miles; and the cannonade of a naval engagement in 1672, between the Dutch and the English, was heard across England as far as Shrewsbury, and even in Wales, a distance of above 200 miles.

FREDERICK.

I have often seen in shops a speaking-pipe, by means of which people give directions to others below.

MRS. F.

Yes; and, of course, you understand the principle of its invention. The difficulty in transmitting sounds arises from sound spreading and losing itself in the surrounding air: confine it, and you can convey it to an immense distance.

ESTHER.

When you took us last year to see Carisbrook Castle, I recollect that I dropt a pin down the well, and we all heard it distinctly strike against the water, though the well is 210 feet deep.

MRS. F.

In the cast-iron water pipe at Paris, the lowest whisper at one end; is distinctly heard at the other, a distance of 3120 feet.

ESTHER.

Is the pipe straight?

MRS. F.

It has only two bendings, which are near the middle. A pistol fired at one end, blew out a candle at the other. But have you heard of the newly invented bell?

HENRIETTA.

No, aunt.

MRS. F.

It is formed of a wooden or tin tube with a small piston at each end. By pushing in one piston, the air in the tube conveys the effect to the piston at the other end, which strikes against a bell; this piston being, as it were, the clapper on the outside of the bell.

FREDERICK.

How ingenious!

MRS. F.

The next point to be considered is the phenomenon of reflected sounds or echoes, some of which are hardly credible. Sound is reflected in the same manner as light.

ESTHER.

The angle of reflection being equal to the angle of incidence.

MRS. F.

Or to speak in less philosophical, but perhaps more intelligible terms, the angle by which light or sound is reflected back from an even surface, is exactly equal to that by which it is received.

HENRIETTA.

I have heard of an echo which repeats sixty times.

ESTHER.

That is at the Marquis Simonetta's villa near Milan, and has been described by Addison.

MRS. F.

But in some travels in Sicily, which I was reading yesterday, I met with a curious circumstance, which you shall hear. "In the cathedral of Gergenti in Sicily (the ancient Agrigentum), the slightest whisper is borne with perfect distinctness from the great western door to the cornice behind the high altar, a distance of 250 feet. By a most unlucky coincidence, the precise point of divergence near the door, was chosen for the

place of the confessional; and a person, by placing himself in the opposite point, distinctly heard every thing which was said in the confessional. Secrets never intended for the public ear thus became known, to the dismay of the confessors, and the amusement of the people, until at last, a listener discovered the secret, and the confessional was removed."*

ESTHER.

How disagreeable an echo is, in a room where people are singing.

MRS. F.

In a small room an echo strengthens the voice, because it is so soon reflected back from the walls that the echo is not distinguished from the original sound; but, in large buildings such as cathedrals, where the original sound and the echo are distinctly separated, the effect is very disagreeable. I do not call your attention to harmonic sounds, for the subject is too long and too difficult for present discussion.

FREDERICK.

Is sound easily conveyed under water?

MRS. F.

Yes, with great velocity. It travels about 9000 feet in three seconds, when the temperature of the water is at 62° Fahrenheit; and in the Lake of Geneva, some experiments were made, which shows that it travels 4708 feet a second when the temperature is at 46°.

FREDERICK.

Aunt, the boys at school have often puzzled me, by tapping with the head of a pin at one end of a log of timber, when I heard the sound distinctly although I was placed at the other. How is that accounted for?

MRS. F.

By the property which solid bodies possess of transmitting

* Travels through Sicily in 1824, by a Naval Officer.

sound with great facility and distinctness. Two Danish philosophers* have shown this by a curious experiment.

ESTHER.

What is it?

MRS. F.

Having stretched a metallic wire 600 feet long, in a horizontal direction, they suspended at one end a plate of sonorous metal; and when this was slightly struck, the auditor, at the other end, with the wire in his teeth, heard, at every stroke, two distinct sounds, one conveyed almost instantly along the wire, and the other transmitted more slowly through the air. By some experiments made in the pipes of Paris, it was ascertained, that sound travels along cast-iron about $10\frac{1}{2}$ times quicker than in air. Glass, iron, and woods are the solids which convey it with the greatest velocity.† There are several other curious points connected with sounds, such as ventriloquism, &c., which I must leave for the present.

FREDERICK.

Do ventriloquists really speak from their stomachs?

MRS. F.

No; I believe it is now generally agreed that all these sounds are practised in the throat.

ESTHER.

In what, then, does the art of ventriloquism consist?

MRS. F.

It is founded upon that property of sound, by virtue of which, the human ear is unable to judge with any accuracy of the direction in which sounds reach it. The art, then, consists in the power of imitating sounds, not only in their ordinary character, but as modified by distance, obstruction,

* Messrs. Herhold and Rafn. † About 18,530 feet a second.

and other causes, and also, in the power of executing these imitations by muscular exertions which cannot be seen by the spectators. These sounds, then, are produced by the muscles of the throat, assisted by the action of the tongue upon the palate, the teeth, and the inside of the lips — all of them being movements perfectly compatible with the absolute expression of silence in the countenance, and which may be performed without the movement of the lips themselves.

ESTHER.

But, how does the ventriloquist contrive to give the voice the effect of proceeding from the direction he requires?

MRS. F.

If you observe a ventriloquist, you will perceive that he always manages to place himself in the same direction as that in which he wishes the sound to come from. If it be a watchman in the street, that he attempts to represent, he will station himself at the window whence the sound of the *real* watchman would have entered; or, if he pretends to make a child sing, he will place his head as near as possible to the child's chest, in order to assimilate more closely the real and fictitious direction of the sound.

ESTHER.

Then were he, in the first case, to place himself at a window on the opposite side of the room, or, in the other, to sing six or eight feet from the child, he would soon be detected.

MRS. F.

Exactly so. It is curious to find how acutely sensible is the human ear. Mons. Savart, who has been engaged in experiments on its sensibility, has ascertained that this organ is capable of appreciating sounds which arise from about 42,000 vibrations in a second; and, consequently, that we can hear a sound which lasts only the 24,000th part of a second.

FREDERICK.

Talking of sound, aunt, I have heard that the famous ear

of Dionysius is still to be seen at Syracuse. Is that the case?

MRS. F.

It is so; at least, there is a cavern, adjoining the stone quarries, which bears the name. This tradition is believed by all the Syracusans, and the cave is certainly constructed according to the resemblance of an ear, and is endowed with some extraordinary properties of sound. But the story rests upon no historical evidence whatever. This cavern is about 183 feet long, 70 high, and varies in width from 16 to 30 feet. The sides slope gradually to the summit, and terminate by a narrow channel, decreasing to about 20 inches, which communicates with what is called, the secret chamber of Dionysius. The power of the lower cavern in conveying sound, is certainly great, a whisper being easily heard; and the full voice reverberates so strongly, that it is almost drowned by the echoes, and if several persons speak at the same time, they are quite unintelligible. A bugle horn or flute is multiplied almost into a band of music; the firing of a pistol sounds like the report of a cannon, and lasts ten seconds; and the tearing of a piece of paper is distinctly heard, from one end of the cavern to the other. But there appears to have been no access to the secret chamber, except the almost inaccessible one, 70 feet from the ground, by which travellers, at present, enter by a rope and pulley; and though the design of this curious cavern will probably always remain a mystery, yet it is more likely to have been formed as an experiment in acoustics by some ingenious mechanic, than to have been constructed by the order of Dionysius, whose character appears to have been much misrepresented by party writers.*

ESTHER.

One thing more, mamma, before we finish. Will you explain to us the nature of the sounds which issued from the celebrated statue of Memnon?

MRS. F.

Until very lately, they were attributed to natural causes,

* Hughes's Travels in Greece and Albania.

and were supposed to have been occasioned by the transmission of rarefied air through the crevices of a sonorous stone, like many other instances which exist of a similar phenomenon. The scientific men who accompanied the French expedition into Egypt heard, at sunrise, in a monument of granite in the palace of Karnac, a noise resembling the breaking of a string, which is the very expression used by Pausanias to describe the sound of the Memnon. De Humboldt speaks in the Orinoco of musical rocks (*loxas de musica**), which sounded at sunrise; and recent travellers have given explicit accounts of rocks in Arabia Petræa which also emit sounds at particular hours of the day; and indeed Sir A. Smith asserts, that at six o'clock in the morning, he heard very distinctly the sounds issue from Memnon which had rendered it so famous in ancient times. Now, in all these instances, the sound is supposed to proceed from the sudden change of temperature which takes place at the rising of the sun. The stones are heated during the day by the action of the sun, and the difference of temperature between the subterraneous and the external air attains its maximum (or greatest difference) about sunrise, or, at that moment which is furthest from the period of the greatest heat of the preceding day. The sound therefore proceeds from the impulse of air upon the stones; and the Egyptian priests, having observed the phenomenon on some rocks in Egypt, were supposed to have arranged the stones of the pedestal of Memnon so as to produce this singular effect; but it now appears, from the relation of Mr. Wilkinson, that on ascending the statue he found that there is a stone in its lap, which, upon being struck, emits a metallic sound, and which might still be made use of to deceive the credulous. In the block behind, is cut a squared space, as if to admit a person, who might be placed there to strike the stone, and who would lie concealed from the most scrutinous observer in the plain below. Mr. Wilkinson is therefore convinced that this sound was the same that deceived the Roman visitors, with whose description of it, it perfectly accords.†

* Voyage, vol. vi. p. 377.

† Wilkinson's Thebes, p. 97.

ESTHER.

Thank you, mamma. I suppose many of the tricks of the ancient priests may now be explained by natural causes.

MRS. F.

Yes; there seems to be little doubt but that the Pagan priesthood kept all the mysteries of science confined to the recesses of their temples, and employed them to delude, with apparent miracles, the rest of mankind, who, unsuspecting of fraud, and unacquainted with the powers of nature, regarded as supernatural, that which was the effect of human agency.—In the trials to which they subjected the initiated, or candidates for the priesthood, “we cannot mistake at first sight an ingenious application of the secrets of mechanics and acoustics; the scientific illusions of optics, perspective, and phantasmagoria; different inventions belonging to hydrostatics and chemistry; the skilful exercise of practical observations on the habits and sensation of animals; lastly, the employment of secrets, used in every age, by means of which the human frame is preserved and rendered invulnerable to the action of fire.*

ESTHER.

But we find no positive accounts of the knowledge of all these sciences in the writings of the ancients?

MRS. F.

No; because the writers of antiquity either belonged to the priesthood and were interested in perpetuating the delusion; or, as more frequently happened, were deceived themselves. But the effects speak, and oblige us to admit the existence of the causes. What the ancients state they have done, we possess the means of doing. Equally available methods therefore, were known to them.

FREDERICK.

Thank you, aunt; but how are all the wonders of the Cave of Trophonius accounted for?

* *Salverte, des Sciences Occultes des Anciens.*

MRS. F.

That the magical slumbers, dreams, and visions, which were produced in the Cave of Trophonius, were the effect of some powerful narcotic acting upon the body after the mind had been predisposed by a certain train of ideas, seems now correctly supposed; and to some ingenious mechanism may be attributed the mystery of the same cave. Its entrance was too narrow to admit the passage of a man; yet, when once his knees had entered, the whole body was rapidly drawn within. To the mechanism that acted upon the votary was added, on this occasion, some other which enlarged the opening.* Thus the progress of science enables us to account for many of the supposed miracles of the Heathens; and it is wiser, therefore, to conclude that they possessed many of the secrets of science, than to accuse of falsehood so many accounts, of which the advancement of knowledge has caused the wonder and impossibility to disappear.

* Salverte.

CHAPTER VIII.

ST. VINCENT DE PAUL.

ST. VINCENT DE PAUL.—CAPTIVITY AT TUNIS.—TUTOR TO CARDINAL DE RETZ.—CHANGES PLACES WITH A GALLEY SLAVE.—SŒURS DE LA CHARITE.—PRESIDENT OF THE COUNCIL OF CONSCIENCE.—SALPETRIERE.—SENDS SUPPLIES TO LORRAINE.—ENFANS TROUVES.—HIS DEATH.—FOUNDATION OF THE ORPHAN ASYLUM.—ST. VINCENT IS CANONIZED BY THE POPE.

“A favorite band, whom mercy mild,
 God’s best lov’d attribute, adorned; whose gate
 Stood ever open to the stranger’s call;
 Who fed the hungry, to the thirsty lip
 Reach’d the friendly cup; whose care benign
 From the rude blast secur’d the pilgrim’s side;
 Who heard the widow’s tender tale, and shook
 The shackles from the prisoner’s feet;
 Who each endearing tye, each office knew,
 Of meek-eyed, heaven-descended charity.”

HENRIETTA.

ESTHER, what have you been reading this morning?

ESTHER.

A biography of St. Vincent de Paul, the founder of the Hôpital des Enfants Trouvés at Paris, and also of the Institution of the Sœurs de la Charité.

HENRIETTA.

I never heard of him before. Will you give me some account of his life?

ESTHER.

I was going to propose it for our amusement this afternoon,

as it rains too fast to go out. Mamma has kindly lent me her notes, which I will read to you, if you will call Mary and Frederick, as I should like them both to hear the biography of St. Vincent; for no one carried philanthropy to the extent which he did, and his life is a bright example of the good which a simple individual may do to his fellow creatures, without any assistance but that of virtue, and the blessing of Heaven upon his endeavors.

Henrietta having returned with her cousins, Esther began her narrative.

ESTHER.

Vincent de Paul was born at the close of the sixteenth century,* in the obscure village of Pouy, near Dax, in the centre of those sandy tracts which are known under the name of the Landes.

HENRIETTA.

That is the country where the people walk upon stilts, is it not?

ESTHER.

It is; for were they not to adopt this expedient, they would be unable to traverse these sandy tracts, where they sink at every step which they take. But to return to our biography:

His parents were poor labourers, and Vincent spent his early years in tending his father's flock, a fit preparation for those pastoral duties which Providence had designed him to perform. The house in which he lived was afterwards converted into a chapel, which even revolutionary fury knew how to respect; and near it, stands an ancient oak, under which, tradition relates, that the youthful shepherd loved to recline, and which was often perhaps the scene of his early benevolence; for, even at that period of his life, he gave "according to his ability," and would cheerfully endure the calls of hunger in order to bestow his scanty meal upon the first beggar whom

* In 1574.

he met. His early promise induced his father to educate him for the church; and he was admitted, at the age of twenty, into ecclesiastical orders. In 1605, he was taken prisoner by a pirate, when on a voyage from Narbonne to Marseilles; and carried as a slave to Tunis. After having been three times sold in the public market, Vincent at last became the property of a renegade, upon whom his conversation, his patience, and his resignation produced such a change, that he repented of his apostacy, and was anxious to escape from Tunis with Vincent. In the middle of the night, in a frail boat, without compass and without a pilot, these two men set sail to traverse the Mediterranean; but Providence guided their bark, and they reached France in safety; and Vincent had soon afterwards the joy of seeing his renegade companion again admitted into the church which he had forsaken. Nor was he, in after life, unmindful of the lesson taught him by the rigors of his three years' captivity. After having sent a large sum to redeem his successors in misfortune, and having founded an hospital for them within the walls of Algiers, he established a permanent fund for the redemption of the slaves, and sent them colonies of missionaries to confirm and strengthen their faith during their continuance in bondage. Hearing that the parish of Châtillon was without a pastor, it having been three times refused in one year, in consequence of the poorness of its endowment, Vincent directly applied for the appointment, and obtained it. Here he had a full opportunity of seeing the influence of a conscientious minister; and while he gained the confidence and affections of his flock, he was able to mature his plans for the reformation of the abuses which existed among the clergy. But he was soon* called upon to leave his parish and to take charge of the three sons of the Marquis de Gondi, the general of the galleys: one of these pupils was the celebrated Cardinal de Retz, well known in the war of the Fronde, and who profited but little from the lessons of such a master, although he afterwards, when in authority himself, sanctioned and protected all the establishments of Vincent de Paul.

* 1613.

Though a teacher of others, Vincent did not neglect the discipline of himself; and his struggles with his own infirmities have not been left unrecorded. Finding that in his intercourse with the great, there was a certain roughness in his manners, he felt the necessity of correcting them. He directly, as he states, addressed himself to the Most High, and prayed Him to change his harsh and forbidding manners and give him a gentle and benignant heart. One would imagine that his prayer was heard, for his gentleness and affability became afterwards proverbial.

During the three years which he passed in the family of the Marquis de Gondi, Vincent regularly visited the galley slaves, among whom he appears to have been thrown by Providence, the more to place them under his special protection. The change which he worked in the minds of these unhappy men was incredible; he succeeded in making the galleys, these dens of wickedness, temples to the living God, whose praises now issued from mouths which before were filled with blasphemy and execration.

The year 1622 is remarkable for an act of self-devotion, of which none but a Christian could be capable. Being anxious to form a just opinion of the actual state of the galleys, Vincent set out for Marseilles alone and unknown. As he went from one malefactor to another, and heard their different tales of crime and woe, there was one man who appeared more despairing than the rest, and whose miserable countenance excited his warmest sympathy. Vincent inquired into the cause of his despair, and learned that he had been unjustly condemned for some trivial offence to the galleys, and that he had a mother, a wife, and children, who were all reduced to the most abject misery by his slavery. Touched by his misfortunes, and knowing no other way of remedying them, Vincent took the generous resolution of changing places with the criminal. Like St. Paulinus,* who sold himself to redeem from captivity the son of a poor widow, Vincent (by permission of the officers) placed himself in the stead of the

* Bishop of Nola—born 353.

young galley slave; with his own hands fixed the chain round himself, and then desired the criminal to depart quickly and carry peace and consolation to his afflicted relations. How long Vincent remained in his voluntary captivity is uncertain, so various are the accounts of different writers; but it appears that although he had taken every precaution not to be recognised, the Countess de Joigny, daughter-in-law to the Marquis de Gondi, being uneasy at his disappearance, took such active measures to find him, that he was discovered and liberated. He ever after felt the acutest pain from the irritation and weight of his self-imposed fetters, which were the cause of severe suffering to him to the end of his life.—Again did Vincent, on his liberation, turn his own sufferings to the benefit of humanity, and learn from his own “to weep at others’ woe.” In prosperity he paid the debt of gratitude he owed to Providence, by founding at Marseilles an hospital for the reception of the galley slaves. He never would allude to this extraordinary action, so anxious was he to conceal his noble self-sacrifice; but Louis XIII immediately conferred upon him the appointment of Almoner-General of the Gallies.

The rich establishment of St. Lazarus was soon after assigned to him, in order that he might apply its revenues to the relief and instruction of the inhabitants of the country. Vincent took a year to consider the proposal, so unequal did his humble mind lead him to consider himself, to undertake so responsible a stewardship. He established the congregation of missionaries, some of whom were destined to extend the gospel in distant regions, others to go on home missions into the different provinces of France.

HENRIETTA.

But, did you not tell us that he also founded the establishment of the *Sœurs de la Charité*?

ESTHER.

He did. This is, indeed, one of the noblest institutions of humanity, and nothing but Christianity could lead the human

mind to so great a sacrifice as that which is made by these humble servants of their Master. Their quiet unobtrusive works of charity, may be compared to the gentle dew from heaven, which sinks secretly and silently into the earth, which it refreshes with its vivifying influence. None were admitted into the sisterhood whose family had not borne an irreproachable character for several generations; and in order to preclude the possibility of any lingering feeling towards the world, Vincent required that they should only be received into the establishment after five years of probation, so that they might enter the sisterhood fully aware of the arduous duties which they undertook; nor would he then allow them to dedicate themselves for more than one year, but required that annually their vows should be renewed, so that no backsliders or unwilling or lukewarm servant should be engaged in so righteous a cause. "You will have," he said, "no monasteries but the houses of the poor, no cloisters but the streets of towns and the rooms of hospitals, no enclosure but obedience, no veil except a holy modesty. My intention is, that you tend every infirm person as a tender mother who watches over an only son." No duties are imposed upon them but the relief of suffering humanity; and every moment is so entirely devoted to the care of the wretched, their lives are so occupied by the exercise of works of charity, that they have no disposition for levity, but count all the most heavenly virtues of our nature as the ordinary employment of life.

In 1643, Vincent was summoned to attend the death-bed of Louis XIII, who wished for this holy man to assist and support him in his last hour. According to the desire of the dying monarch, Anne of Austria named him President of her Council of Conscience, an office which gave him great weight in the nomination of the clergy, and in the regulation of ecclesiastical affairs, but he would never accept any preferment himself; and, in honorable indigence, attended for ten years the Council of the Regent, with all the simplicity of a village pastor.

The next great work of St. Vincent, of whom the Almighty appeared to bless the undertakings,* was the foundation of the Salpêtrière Hospital.

HENRIETTA.

What a singular name!

ESTHER.

It was so called because it was erected on the site of a manufactory for saltpetre.

In Paris there were then 40,000 beggars reduced to the most abject misery. Such an undertaking alarmed even the most zealous of his coadjutors; but Vincent always answered that, "the treasures of Providence were inexhaustible, and that distrust dishonored God. Let us only begin," he would say, "and God will finish." He founded the Hospital of the Salpêtrière, which receives, in perpetuity, 6000 persons. He went to solicit assistance in his undertaking of the Regent; but she excused herself upon the state of the times, and answered that she had nothing left to give. "And your diamonds, madam," answered he; "does a queen require them?" Anne immediately unclasped her diamonds and gave them to him, desiring him to keep the secret of her sacrifice. "No," exclaimed Vincent de Paul, "I cannot keep it; I have much good to do, and it is necessary for the interests of the poor that such an example of charity should be known by the whole kingdom."

Vincent next sent large supplies for the relief of Lorraine, which, during the government of their Duke, Charles IV, was reduced to the greatest distress by war, pestilence, and famine. A deputation was sent by this wretched province, not to the Sovereign, or to the Ministers of State, but to a poor priest — to the humble Vincent, whom they designated in their address, as steward of the affairs of God. Nor were they disappointed in their confidence. For ten successive years he sent money, food, cattle, clothing, &c. to his dis-

* "And look whatsoever he doeth it shall prosper."

tressed countrymen; and so unbounded was his liberality, that, at the termination of their calamities, a general procession was ordered to beseech the Almighty to preserve the life of their benefactor, and to shower His choicest blessings upon the saviour of their province. When the wars of the Fronde afterwards ravaged the other provinces of France, they also experienced his tender care, and he caused immense sums of money to be transmitted to them.

FREDERICK.

But where did he get so much wealth to distribute, for you said that he was very poor?

ESTHER.

First, by the irresistible force of his eloquence and his example; by the universal opinion entertained of his sanctity; by the universal confidence which he inspired; and, lastly, by means of that holy assembly which met every week in his church of St. Lazare, to deliberate upon the wants of their fellow-creatures, and to adopt the best means of relieving them. In these assemblies were all the great and virtuous of the Kingdom — pontiffs, princes, magistrates, the Regent Anne, of Austria, the Queen of Poland, and all the rich and the charitable, who laid their treasures at the feet of Vincent, confident that they would be applied to the best purposes.

A traveller upon earth, a sojourner, as we all are, Vincent felt the necessity of redoubling his exertions as he drew nearer the close of his pilgrimage, and his good works multiplied in proportion as he had the less time to execute them. The Foundling Hospital next called forth his generous exertions. Returning, on one occasion, from a mission, Vincent found under the walls of Paris, a wretched infant, whose limbs a beggar was on the point of distorting, in order to make the little sufferer an object of commiseration, and consequently of gain, to its inhuman master. "Barbarian!" exclaimed St. Vincent, as he rushed upon him. "I am de-

ceived, for I took you, at a distance, for a human being." Snatching his victim from him, Vincent carried it in his arms through Paris, assembled a crowd around him, to whom he related this tale of horror, and conjured them to co-operate with him in rescuing these helpless innocents from destruction. His appeal was heard, and he met with the most ready assistance and co-operation: but soon the number of these deserted infants became so great, that all those who had hitherto assisted him, came to tell him that they must leave them to their fate. Undaunted by the obstacles which surrounded him, Vincent asked only for one day, and mustered an extraordinary assembly for the following morning. Vincent caused five hundred of these poor orphans to be placed in the sanctuary of his church, in the arms of Sisters of Charity. He then mounted his pulpit, and addressed the assembly in behalf of the infants they were about to abandon, concluding with an appeal to the female part of his auditors. "Now, ladies, you have adopted these children; you have become their mothers after grace, since their mothers after nature have forsaken them. Consider if you also will abandon them for ever. Cease in this moment to be their mothers, and become their judges. Their life and death are in your hands. I am going to take your votes and suffrages. It is time that you pass judgment upon them. There they are before you. If you continue your care over them, they will live; if you desert them, they will all die to-morrow." The appeal was not made in vain, the cause of humanity had never a greater triumph. This same assembly, which had met resolved to forsake the children, voted by acclamation the foundation of their hospital, and endowed it immediately with considerable funds — so electrified were they all by the eloquence of St. Vincent.

But his career of usefulness was now drawing to a close. The health of St. Vincent began visibly to decline; and though forced by the Archbishop of Paris to accept a carriage which the Queen Regent had given to him, it was with the greatest difficulty that he could be persuaded to make use of it. He called it always "his shame;" and it was usually

employed in conveying the infirm and the sick whom he met in his road, to their homes or to the hospitals. The last four years of his life Vincent was unable to leave the house; but he still continued his superintendence of the poor, and no work of charity was entered upon without his participation.

After severe suffering, he died in 1660, at the age of 87. His remains were attended to the grave by all his fellow-workers in charity. At the termination of his obsequies, the Princess de Conti reminded the bystanders that this virtuous man was not allowed time to mature a project which he had formed, of opening an asylum for the orphans of poor artisans. She ended her appeal by asking them, "if they would leave him *one regret* beyond the grave!" At these words, without any deliberation, all decided unanimously to pay this last tribute to his memory, and the foundation of the Orphan Asylum was determined upon at his tomb.

At the head of nine sovereign princes, Louis XIV asked his canonization; and on obtaining it, Louis XV ordered the liberation of twelve galley slaves at Marseilles, who had been condemned to perpetual labor. But, an old man, who had known Vincent at Marseilles, when he heard of the intention to canonize him, exclaimed, "What! you wish to canonize him! Oh! I knew him well—he will never allow it; he was too humble." Paris owes to him the foundation of thirty-five charitable institutions, besides those which are scattered all over France. Thus did this humble apostle of humanity leave a number of establishments more useful to his country than the trophied monuments of his ostentatious sovereign Louis XIV.

HENRIETTA.

Thank you, Esther; I am sure, that we have all been much interested by your biography.

ESTHER.

I am glad that you have; but, recollect one thing—it is to God, not to man, that we must ascribe the praise. It is to

the religion of our blessed Saviour that this great man belonged — it is the spirit of Jesus alone, which could have created such wonders; for nothing but the regenerating influence of the Christian religion, could have produced such an example of holiness, benevolence, and humility.

CHAPTER IX.

THE SUGAR CANE.

HARD AND SOFT WATER.—SUGAR, HISTORY OF.—IDEAS RESPECTING IT.—INTRODUCED INTO THE COLONIES.—SUGAR REFINING.—ALIMENTARY QUALITIES.—BODY GUARD OF THE KING OF COCHIN CHINA.—HINDOO TRADITION.—SPECIES OF SUGAR CANE.—MANNA. EARLY RISING.—ANECDOTE OF FREDERICK II.—ECONOMY OF TIME.—DESTRUCTION OF BOOKS BY A BEETLE.

“ESTHER,” said Mrs. Fortescue, as the party were seated at the tea-table, “how very weak the tea is this evening?”

ESTHER.

So it is, mamma; and I know not how to account for it, for the water was boiling when I made the tea.

MRS. F.

Perhaps, by mistake, they have given us hard water.

HENRIETTA.

Aunt, I often hear people talk of *hard* and *soft* water. Will you have the kindness to explain to me in what the difference consists?

MRS. F.

The distinction of soft and hard water has reference to its greater or less purity. Spring and river water are generally more or less contaminated with foreign substances, while rain water is much more pure. Hard water, as you are aware, will not dissolve soap; nor is it calculated for extracting the flavor of tea. This is in consequence of the quantity of sulphate of lime it contains, which, if you were a chemist, you would know decomposes, or, as we call it, curdles soap, separating the materials of which it is composed.

FREDERICK.

But what is it that forms such a crust sometimes inside the kettles or other vessels in which water is boiled?

MRS. F.

That is carbonate of lime, which appears to be held in solution by an excess of carbonic acid. Such water is less *hard* than that which contains sulphate of lime, and becomes *soft* by boiling, when the overplus carbonic acid is dissipated by the heat, and the pure carbonate of lime being precipitated, forms the coating or incrustation to which you allude. The quality of water is also of great consequence in brewing, and the peculiar flavor of the Burton and other kinds of ale, depends upon the mineral contents of the water employed.

HENRIETTA.

Thank you, aunt, for this explanation. Esther, give me some sugar, if you please.

MRS. F.

I dare say some of you can tell me where sugar first came from.

FREDERICK.

Was it not from the West Indies?

MRS. F.

No, it was imported into those islands.

HENRIETTA.

Then pray tell us, aunt.

MRS. F.

It appears, from a collection of the best authorities, that China was the first country in which sugar was cultivated, and its produce manufactured. It is tolerably well ascertained that the inhabitants of that country enjoyed its use two thousand years before it was known and adopted in Europe.

ESTHER.

When do we first hear of it?

MRS. F.

There is no mention made of sugar in the sacred writings, or in the history of Egypt or Phœnicia. The great physicians, Theophrastus, &c., are the first who have spoken of it, under the name of "Indian salt;" and from the descriptions given of it by Pliny and Dioscorides, it appears, that it was produced only in the form that we now call sugar-candy.—The "Indian salt" was brought to Greece and Rome from India within the Ganges, and Arabia; but it was not cultivated in these countries. The sugar cane then only grew in the Islands of the Indian Archipelago, in the kingdoms of Bengal, Siam, &c.; and the sugar produced from it passed, with perfumery, spices and other merchandise, to the countries on this side of the Ganges. It found its way into Arabia in the 13th century, that being the period when merchants first began to visit India.

HENRIETTA.

Did the merchants know what plant produced the sugar?

MRS. F.

The Indians, who carried sugar to Ormus, informed the merchants that they extracted it from a reed; but this indefinite assertion, divested of all circumstantial detail, gave rise to a variety of speculations respecting a plant which yielded so extraordinary a product.* Some thought it a kind of honey which formed itself without the assistance of bees; others considered it as a shower from heaven which fell upon

* On the strength of this information, the Asiatics on this side the Ganges sought among their reeds for one which yielded so precious a production, and found a kind of Bamboo (called *Mambu*), which gave a white spongy concretion somewhat similar in taste to sugar. The Arabians also strove to find sugar in their country, and the concrete juice of a kind of Dogsbane (*Apocynum*), known to them by the name of *Alhasser*, they called sugar. Hence Avicennes speaks of three sorts of sugar; *Zucca arundineum*, which is the Indian salt, or our sugar-candy, the *Zuccar mambu*, or Tabaxir of the Persians; and *Alhasser Zuccar* of the Arabians.

the leaves of the reed; while others again imagined it was the concretion of the reed, formed in the manner of gum.

ESTHER.

When did they first find out the truth respecting it?

MRS. F.

In the year 1250, when all these fanciful speculations were put an end to, by a Venetian traveller.

HENRIETTA.

Oh! that must be Marco Polo, about whom you were telling us some weeks since.*

MRS. F.

It was so. The merchants, who before that period, had only gone to Ormus, now emboldened by his example, extended their voyages, and brought away the sugar-cane and the silk-worm. The story of the latter being concealed in a reed, you all know. Arabia Felix was the first nursery of these productions, whence they passed into Nubia, Ethiopia, and Egypt, where sugar was soon made in great abundance.



Sugar-cane.

HENRIETTA.

Where was it next sent to?

* See chap. 2.

MRS. F.

On the discovery of Madeira, in 1420, Don Henry introduced the sugar-cane into that island, from Sicily, where, as well as in the Canaries, it was cultivated with success; and when Columbus discovered the New World, Pierre d'Etienne took the sugar-cane to Hispaniola, where its cultivation extended with such rapidity, and the revenues it brought in were so considerable, that we are told the cost of the palaces of Madrid and Toledo, built by Charles the Fifth, was defrayed by the proceeds of the port duties on the sugar imported from Hispaniola.

ESTHER.

The sugar-cane still exists in Sicily, and small plantations of it are to be seen at the village of Avola, near Syracuse, where they are kept up as objects of curiosity. The district between Syracuse and Catania was celebrated for sugar-canes at the time that Sicily was obliged to furnish one thousand pounds weight annually for the Knights of Malta. But, was it never cultivated in any other part of Europe except in Sicily?

MRS. F.

Yes; it was planted in Provence, but the climate proved too cold. In Spain there exists sugar manufactories, I believe, even to this day.

ESTHER.

How far north may it be cultivated?

MRS. F.

As high as the 40th degree of latitude; but the torrid zone is most favorable for its production.

FREDERICK.

When did our West Indian Islands begin to cultivate it?

MRS. F.

Sugar-canes were transplanted to Barbadoes from Brazil (where they had been taken by the Spanish and the Portu-

guese settlers) in 1641, and from that island were sent to the others.

ESTHER.

But it was not until late that sugar was much used in England.

MRS. F.

No; so late as 1466, the use of sugar in England was confined to medicines and feasts, and it was sold in apothecaries' shops. Its scarcity continued until 1580, when it was brought from Brazil to Portugal, and thence to this country. Such is the history of the introduction of sugar. It now only remains to tell you, that the art of extracting the sugar and of refining it, among the Chinese, consisted in obtaining it in its greatest purity under its crystalline form, or sugar-candy. This art was not brought from India with the cane, and, consequently, it was some time before a proper mode of preparing it was invented; and the first sugar produced was black, and filled with impurities. At the end of the fifteenth century, the Venetians introduced the art of sugar refining into Europe. They first imitated the Chinese and purified the coarse sugar of Egypt, by refining it three or four times over and selling it in the shape of candy. They afterwards adopted the use of cones, and sold refined sugar in the loaf.*

HENRIETTA.

How is sugar refined?

MRS. F.

That, Henrietta, I must leave you to ascertain yourself, and I will point out to you what books to consult on the subject of the manufacture of sugar; its refining, claying, &c.; but, as I have often told you, my object in thus conversing with you, is not to save you the trouble of reading, but rather to stimulate you with an additional desire for it; and, there-

* Sugar refining was first practised in England in 1544.

fore, I often only allude to points upon which you probably are ignorant, purposely to lead you of yourself to seek the information you stand in need of.

FREDERICK.

Is not sugar very wholesome, aunt?

MRS. F.

A French chemist* calls it "the most perfect alimentary substance in nature." It has always been esteemed very beneficial, and analysis has proved, that "it affords the greatest quantity of nourishment, in a given quantity of matter, of any substance in nature."† During the crop time in the West Indies, the negroes grow fat and flourishing, and the sickly among them revive and recover their health. In China and in India, the same beneficial effects are recorded; in the former country, we are told by Sir George Staunton, that many of the slaves and idle persons are frequently missing about the time that the canes are ripe, hiding themselves and living entirely in the plantations.

FREDERICK.

And do cattle like it?

MRS. F.

Yes; it is not less wholesome to the brute creation. Horses and cattle have subsisted for months at St. Domingo upon it alone; and, during the crop time, when they are fed upon the cane-tops, they become sleek and in better condition than at any other time, though worked harder. In Cochin China, horses, buffaloes, elephants, and all domestic animals are fattened upon the sugar-cane; and the people themselves consume a great quantity of sugar.

HENRIETTA.

How do they eat it?

MRS. F.

Generally with their rice; and there is little else but these

* Dutrene.

† Dr. Rush of Philadelphia.

two substances to be met with as food in all the inns: but the opinion of the fattening properties of sugar has given rise to a whimsical law in Cochin China.

MARY.

What is that, mamma?

MRS. F.

The body guard of the king, selected for purposes of pomp and show, are allowed a sum of money, with which they must buy sugar and sugar-canes, and they are compelled, by law, to eat a certain quantity daily. This is to preserve the fat sleek appearance of those soldiers who are honored by approaching so near the person of the king; and travellers relate that they certainly do honor to their master by their handsome appearance. There are about five hundred of these men, all equally plump and well-looking, who are thus actually fattened upon sugar.

Now, I believe that I have told you all that occurs to me at present respecting sugar.

HENRIETTA.

And we are much obliged to you for it, aunt.

ESTHER.

The Hindoos have a curious tradition of the manner in which the sugar-cane came to their country, which proves in what high estimation it is held by them.

MRS. F.

I should like to hear it.

ESTHER.

They relate that, in very ancient times, a vessel belonging to their country, chanced to leave one of her crew, who was suffering under severe illness, upon a desert island, at a considerable distance, in the Indian seas; and that returning by the same route, curiosity prompted them to inquire after the fate of their comrade, when, to their utter astonishment, the man presented himself before them, completely recovered

from his sickness, and even in a state of more than common health. With eagerness, they inquired for the medicine he had so successfully used, upon which he acquainted them that he had subsisted, from the time of their departure, *solely* upon the sugar-cane. Attracted by such a powerful recommendation, the precious plant was carefully transplanted, and cultivated in their own country.*

HENRIETTA.

Thank you, Esther, for your story. Is there more than one kind of sugar-cane?

MRS. F.

Yes; there are several species or varieties, of which the old Creole cane, the cane of Otaheite (or Bourbon cane), and the Violet or Batavian cane, are the principal.

ESTHER.

By the old Creole cane, I suppose, mamma, you mean that which was introduced from Sicily to Madeira, the Canaries and the West Indies.†

MRS. F.

Exactly so; for the cane of Otaheite, we are indebted to the voyages of Bougainville, Cook, and Bligh. It is considered as one third more productive than the common cane; is taller, thicker, and altogether more luxuriant in its vegetation. Bougainville transported it to the Isle of France, whence it passed to Cayenne, Martinique, and since 1792, to the other Antilles. The third kind is the violet cane, and is purplish in its foliage; it is a native of Java, and is, I believe, chiefly preferred in the fabrication of rum.

ESTHER.

It is not surprising that the ancients should have thought sugar to have been a concretion on the outside of a tree, for

* Porter on the Sugar Cane, from which work the above account is chiefly taken.

† Humboldt.

they were acquainted with manna, which substance is found in that state.

MRS. F.

But the ancients, though they found manna, yet were unacquainted with its real nature; for, being accustomed to find it upon different kinds of trees, they inferred that it was a substance wholly foreign to the tree itself, an error very easily embraced by those who were not aware that the nutritive juices of trees are nearly, if not wholly the same.

HENRIETTA.

Then, what is manna, aunt? for I must confess that I do not know much about it.

MRS. F.

The manna of commerce is chiefly furnished by the flowering Ash (*Fraxinus Ornus*,) but several other species* of the Ash are also employed.

HENRIETTA.

From what country does it come?

MRS. F.

The Flowering Ash grows abundantly in Calabria, in Sicily, and upon the highest and most rocky mountains of Greece, but it is from Calabria that we chiefly derive manna. In the months of July and August, a portion of the bark is taken off, about three inches long and two inches wide, and an incision is made in the tree; the manna which runs out is collected in baskets, and goes by the name of *manna grossa*, but, when it is required very fine, thin straws or bits of shrubs are applied to the incision, so that the manna in running out, runs upon these substances, and is collected in regular tubes, which are termed by the Calabrians *manna in cannoli*.

* *F. rotundifolia*, *excelsior*, and *parviflora*. The larch, fir, orange, walnut, willow, mulberry, and oak, also produce manna.

ESTHER.

At Briançon, in France, manna is said to be collected from all kinds of shrubs, and the inhabitants observe, that such summers as produce it, are very fatal to the plants. Their walnut trees afford annually a considerable quantity, but, if they happen to yield more than ordinary, they usually perish the following winter. From this it appears evident, that manna is the extravasated juice of trees, and that they cannot afford to lose it, and, what confirms this idea is, their secreting so much more when the summers are hot.*

HENRIETTA.

I cannot think, Esther, where you have learned all these things.

ESTHER.

Chiefly, by reading, Henrietta.

HENRIETTA.

But when do you find time for gaining this kind of information? You are always with us in our morning studies, and walk and amuse yourself with us the rest of the day.

ESTHER.

But, then, I rise early, and have generally an hour or two before breakfast.

HENRIETTA.

I wish I could do the same; but, I am always so sleepy in the morning.

FREDERICK.

Then I will come and awake you, Henrietta, as the boys do at school, with a jug of cold water.

"You would have royal precedent for that," observed Esther, smiling; "but I cannot recommend the practice."

HENRIETTA.

What do you mean by royal, Esther? -

* Medical Botany.

ESTHER.

I allude to an anecdote of Frederick the Great of Prussia, who being anxious to overcome his natural inclination for sleep, which interfered with his plans, first ordered his attendants to awake him at four o'clock, at which hour he intended to leave his bed. They did so; but Frederick was naturally fond of sleep, and therefore always begged for a little more time, which it may easily be supposed he obtained without difficulty; and thus, instead of four, he usually rose at six. In vain he scolded and commanded, for the next morning always found him entreating for more sleep; and where were the attendants that could resist the requests of a despotic monarch? Finally, determined to vanquish himself and his nature, he commanded the person who called him, under pain of being made a common soldier for life, every morning to put upon his face a towel dipped in cold water. By this violent measure, he conquered his natural love of sleep, and continued to rise at four o'clock till an advanced period of his life.*

MRS. F.

Thank you, Esther, for the anecdote. None but those who have felt its benefits, can be conscious of half the advantages resulting from a habit of rising early. Indeed, I look upon it, even in a stronger point of view, as a positive obligation enjoined upon us; inasmuch as we are commanded to redeem the time, and not to waste it in idleness and sloth. That it is conducive to health we all must feel; and, of those persons who have attained an extraordinary age, almost all have been found to have been early risers.† Morning is the season of devotion; and we have the example of Him who is our Law-giver and our Guide, in favor of this practice, as we find it recorded that He rose up "a great while before it was day," and went out to pray.‡ If we only just rise from our beds

* Lord Dover's Frederick II. † Sir J. Sinclair.

‡ St. Mark, chap. xxv. ver. 1st.

in time to join the family down stairs, the "morning sacrifice" is neglected, and we begin the day by leaving undone that which it is our first duty to perform.

ESTHER.

Seed, an old divine, beautifully expresses this, in a passage which I will read to you.

"Let us take care that every morning, as soon as we rise, we lay hold on this proper season of address, and offer up to God the first fruits of our thoughts, yet fresh, unsullied, and serene, before a busy swarm of vain images crowd in upon the mind. When the spirits, just refreshed with sleep, are brisk and active, and rejoice, like that sun which ushers in the day, to run their course; when all nature, just awakened into being from insensibility, pays its early homage; then let us join in the universal chorus, who are the only creatures in the visible creation, capable of knowing to whom it is addressed."

MRS. F.

Thank you, Esther, these observations are most true, and are beautifully expressed. The more seriously we reflect, the more anxious we become to economise our time, to "catch the transient hour" while yet it may be called our own. As a wise man has justly observed, "Let us render to ourselves a strict account of every hour, that, having taken advantage of the present time, we may have the less need of the future."*

HENRIETTA.

Well, aunt, I am sure that I never thought of it before in so serious a light.

MRS. F.

But the mere calculation of how many years are added to an ordinary life, by rising two hours earlier in the morning, were of itself sufficient stimulus for exertion to the reflective mind, which feels how short time is, for the work of eternity.

* As quoted by Mme. de St. Lambert, in her "Avis d'une Mère à sa Fille," but she does not name the author.

HENRIETTA.

I must try to calculate that.

MRS. F.

Two hours a day will make 730 in the year; estimating the human life at "threescore years and ten," that will make 51,100 hours, which reduce into days.

HENRIETTA.

I must do it with my pencil. Stop, that makes 5 years, 304 days, 4 hours.

ESTHER.

But, Henrietta, you have estimated your day at twenty-four hours; deducting the time of sleep, you should average it at sixteen, so we shall have a larger result from your calculation.

MARY.

It now makes 8 years, 273 days, and 12 hours.

HENRIETTA.

I had no idea that it would have amounted to so much; such a calculation ought to be sufficient to prevent any one from being a sluggard.

MRS. F.

Do you know Thomson's beautiful lines on early rising beginning,

"Falsely luxurious, will not man awake," &c.

Frederick, get the "Seasons," and read them to us; you will find them in "Summer."

FREDERICK.

Yes, aunt, here is the passage; but look, what a curious little round hole this is, in the cover of the book.

HENRIETTA.

So it is. It is as round and exact as if it had been pierced with an awl, and it appears to go half through the book.

MRS. F.

This is the work of some little beetles (*Anobium pertinax* and *strictum*), which are most destructive to libraries. I have heard of a public library which was little frequented, in which twenty-seven folio volumes were perforated in a straight line, by the same insect, in such a manner that, by passing a cord through the hole made by it, the twenty-seven volumes might be taken up at once.* Now, Frederick, begin reading.

* Kirby and Spence, vol. i.

CHAPTER X.

THE GARDEN.

ARUNDO DONAX, PHRAGMITES, ARENARIA. — LAW AGAINST DESTROYING THE BENT. — CALAMUS. — QUILL PENS. — REED USED BY THE TURKS. — USES OF THE REED. — INFLUENCE OF THE CHOICE OF FOOD UPON THE CIVILISATION OF A PEOPLE. — ROSE OF JERICO. — CRUCIFERÆ. — COLORS IN FLOWERS. — NIGHT-SCENTED PLANTS. — NEW ZEALAND FLAX. — IRIS TENAX. — LINNÆA. — BELLADONNA AND GUERNSEY LILIES. — MRS. TIGHE'S LINES. — ROSE OF PÆSTUM. — OTTO OF ROSES. — DOG ROSE. — FRUIT EATEN BY DOGS, FOXES, AND LIZARDS. — APPLE OF SODOM. — STOCK SEED. — BLOOD OF ST. JANUARIUS.

“Il n’y a point de vicissitudes pour les beautés immuables de la nature, tandis que dans les révolutions sanglantes, les palais, les colonnes de marbre, les statues de bronze, les villes mêmes disparaissent en un instant, la simple fleur des champs, bravant tout ces oranges croit, brille et se multiplie toujours.”—MADAME DE GENLIS.

HENRIETTA.

As I see, aunt, that you are going into the garden, will you have the kindness to tell me the name of a plant?

MRS. F.

With pleasure; which is it?

HENRIETTA.

It is that tall reed, at the end of the lower border.

MRS. F.

You are right in supposing it to be a reed, for it is the

Arundo Donax, a plant which I brought with me from Italy, where it is extensively cultivated for fences, training the vines, and for innumerable other purposes. I should think, there would be no difficulty in naturalising it in this country, for it stands the winter perfectly well, and De Candolle has planted it in the moat at Geneva, where it is very thriving. It is much superior to our common reed (*Arundo Phragmites*), as it is more tough and strong.



Arundo Donax.

ESTHER.

Our common reed is also very useful for thatching and for fences, and it is in the large plantations or thickets, formed by this plant, that the sedge and reed warblers (*Sylvia Phragmitis* and *arundinacea*) suspend their nests. I once saw one of these nests; it was fastened to the stems of three or four of the adjoining reeds, so that it bent and rocked with every inclination given by the wind to its support.

MRS. F.

But there is another species of the *Arundo* which is also of the greatest utility, the Mat grass, starr, or bent, as it is often termed (*Arundo arenaria*). This is one of the most

valuable grasses for binding the sand of the sea shore, and raising those banks which, in Lancashire, Norfolk, and especially in Holland, are the chief defence of the country against the encroachments of the ocean. These sand banks are of themselves so loose, that in dry weather the sand would be drifted away by the winds, and expose the inhabitants to frequent inundations, but the creeping branching roots of these plants bind it together, and oppose an irresistible barrier to the ocean.

ESTHER.

Is there more than one kind of grass employed?

MRS. F.

Yes, several; the Lyme grass (*Elymus arenarius*) is perhaps one of the best of all plants for this purpose; and the creeping Fescue grass (*Festuca rubra*) and the Sea Carex (*C. arenaria*) also contribute to the same end. The long and cord-like roots of the latter spread into the loose sand to an immense extent, branching at the extremity, and sending out from the knots many shaggy fibres. Indeed, of such importance is the preservation of these plants, that a town has been overwhelmed with sand, from the cutting down of the trees, and pulling up of the grass in the sand hills; and hence an act was passed in the reign of George II, prohibiting the cutting or destroying of the starr, or bent, under very severe penalties.* Fortunately, cattle will not touch the *Arundo arenaria*, or they probably would be among its most serious depredators.

ESTHER.

Of what reed was the calamus of the ancients made?

MRS. F.

That is not exactly known; they used a reed split like our modern pens for writing upon parchment and papyrus. The style, as you know, was employed for their waxen tablets,

* Burns, vol. i.

and it was prohibited in Italy at different periods, on account of its affording a ready means of revenge to an angry possessor. It was with a stylus that Cassius struck Cæsar, and Caligula caused an obnoxious senator to be massacred with the same weapon. From stylus comes the Italian *stiletto*, which shows the double purpose to which the instrument was applied.*

ESTHER.

Quill pens began first to be known in the seventh century, though they arrived very slowly to us.

MRS. F.

The reed pen of the Turks is made from *Arundo orientalis*; but, with regard to the reed, it has been justly observed, that the different uses to which it has been applied, may be said to mark the different periods in the civilisation of a people; and the Greeks used to say, that reeds had contributed to subjugate a people, by furnishing arrows; to soften manners, by the charm of music; and to develop their intelligence, by offering them the instruments proper for the formation of letters.†

ESTHER.

A most just observation.

MRS. F.

It is singular to mark the influence which a plant sometimes exercises in forming the habits of a people.

ESTHER.

Yes; the Guarinis, for instance, of the Orinoco, who may be said to be almost parasitic upon the Mauritia palm (*M. flexuosa*), and who afford an instance of the human race in perhaps the lowest state of degradation, its existence being chained to a single tree, like the insects which can only subsist upon certain parts of a flower. It would appear that Thomson alludes to Mauritia palm where he says—

* Gell's *Pompeiana*.

† Humboldt's *Voyage*, vol. viii.

" Wide o'er the isles the branching Oronoque
Rolls a brown deluge, and the native drives
To dwell aloft on life-sufficing trees,
At once his dome, his robe, his food, and arms."

MRS. F.

In countries where man lives upon corn, which requires much labour and much ground in order to bring it to perfection, he congregates in villages and towns; but, in South America the isolated situation of the cabins, affords a striking proof of the fruitfulness of nature. One acre of bananas yields more than twelve times the alimentary substance contained in the same space of corn; thus the richness of the soil, while it multiplies the means of subsistence, retards the progress of civilisation, for each family becomes an isolated people, and, consequently, does not make that advance in knowledge which only takes place when society becomes more numerous, and mankind more intimate.

ESTHER.

This solitary mode of life must foster a strong feeling of independence and liberty?

MRS. F.

Undoubtedly it does; but, as I before remarked, it is curious to observe how a series of physical and moral causes should occasion the choice of alimentary plants to influence, as it does, at the same time, three important objects — the association or isolation of families, the progress or retardment of civilisation, and the individual character of the scenery.*

FREDERICK.

Aunt, what is this small plant in a pot?

MRS. F.

It is the celebrated Rose of Jericho.

HENRIETTA.

I never heard of this plant; will you tell us something about it?

* Humboldt's Voyage, vol. iii.

MRS. F.

With pleasure. The Rose of Jericho (*Anastatica hierochuntina*) is, as you see, a dwarf plant, being only from three to four inches high. During the period of vegetation, it is green and soft, but towards the end of its life, the root and branches assume a ligneous or woody consistency. The branches, thus hardened and dried, curve over each other, so as to form an irregular ball. In this state, the plant is rolled by the winds in the sandy deserts of the East, to which it is indigenous, until chance throws it near some humid spot.— Its branches then imbibe the water and spread out, its capsules closed by the drought, open their valves, and the seeds sow themselves where they find the moisture necessary to their vegetation.



Anastatica Hierochuntina.

ESTHER.

What a beautiful provision of Providence!

MRS. F.

This hygroscopic —

HENRIETTA.

Oh! please, aunt, stop and tell me the meaning of that word.

MRS. F.

It is from the Greek, *hugros* moist, and *skopeo* to view; that is, the property of perceiving moisture. You probably

have seen the instrument called a hygrometer, which is constructed to measure the degree of moisture in the atmosphere. But to return to our subject, this hygroscopic nature is not, it appears, peculiar to the Rose of Jericho, but is also possessed by other plants; and the same quality has been lately discovered in the capsule of the *Oenothera*, or Evening Primrose. Many ridiculous stories have been circulated respecting the Rose of Jericho, but they are all destitute of foundation, except in the curious property which I have just related.*

MARY.

Is the plant annual?

ESTHER.

Yes. It bears small white flowers, and is one of the family of Crucifæræ.

MRS. F.

The flowers of almost all this family are either white or yellow. The pretty annual *Heliofila* is, I believe, the only exotic genus which is blue; and the *Braya alpina*, and *Arabis cœrulea* of the Alps, the only two blue species which are natives of Europe.

HENRIETTA.

But do not yellow flowers sometimes have blue varieties?

MRS. F.

Never. It is an established fact, with regard to the colors of flowers, that an originally yellow flower may alter to rose, red, or white, but never to blue; and *vice versa*, a blue flower will never by cultivation, become yellow.†

HENRIETTA.

But there is a yellow and a blue iris?

MRS. F.

True: but they are *distinct* species, and it is of varieties

* Art. Jérose, in Diet. Sciences Naturelles.

† De Candolle on Crucifæræ.

of the *same* species that we are now speaking; such as, for instance, the little Polygalia, (*P. vulgaris*,) which we find of white, lilac, purple, and blue of various shades, from the light to the very dark.

ESTHER.

It is a singular fact,* that the cruciform plants are almost entirely wanting under the tropics, except in the higher regions, which are much elevated above the level of the sea.

MRS. F.

In talking of the colors of Cruciferæ, we did not allude to the dull, dirty white, and lilac hue which exists among the night-scented flowers of this family, such as the night-scented Stock (*Matthiola tristis*) and Rocket, (*Hesperis tristis*,) both of which expand in the evening, and shed a sweet perfume during the night.

ESTHER.

But most flowers of this color, have the same smell, and the same mode of flowering, such as *Pelargonium* and *Gladiolus tristis*.

MRS. F.

Here is a plant which is likely to become of some importance, if its cultivation succeeds in Ireland.

HENRIETTA.

What is it?

MRS. F.

The New Zealand flax (*Phormium tenax*,) which, unlike other flax-bearing plants, produces the flax from the fibres of its leaves, instead of from the stalk. It grows chiefly in moist and marshy soils, and attains from five to seven feet in height. In New Zealand, the plant is held sacred by the natives; but probably only from its domestic utility, as it is not employed in any of their ceremonies. The New Zealand

* Observed by Adanson.

anders are well skilled in the mode of preparing it; the women separate the silky fibre from the leaf, by means of a shell (said to be of the oyster kind,) and convert it into netting, clothing, fishing lines, &c. If the cultivation of it in this country could ever be affected, and a sufficient quantity grown to supply us with cordage, it would lead to great national advantages, by making us independent of the Russian trade for this article.

ESTHER.

Has it been yet used for cordage?

MRS. F.

It has been manufactured in New Holland, and used by the colonial whalers for their whale lines; and recent experiments prove how eminently it is calculated for that purpose.* It appears that it is the strongest of all vegetable fibre; compared with others, it is in the following proportion. The fibre of *Agave Americana* breaks under a weight of 7; Flax, of 11½; Hemp, of 16½; Phormium, of 23 1-11; and Silk, of 24. It possesses also another advantage, which is, that, from its brilliant whiteness and satin-like appearance, it does not require to undergo the process of bleaching, by which the quality of hemp and flax is materially injured. Another plant has been recommended as better suited to our climate than the New Zealand Flax, viz. the *Iris tenax*, a plant of California, where the native tribes make a fine cord from the fibres of the leaves, of which they weave their fishing nets; a purpose for which it is admirably suited, on account of its buoyancy, strength and durability. Snares are made of it, for deer and bears, of such strength, that one not thicker than a sixteen-thread line is sufficient to strangle the great stag of California (*Cervus Alces*), one of the most powerful animals of its tribe.†

ESTHER.

Oh! mamma, here is our favorite *Linnaea borealis* in bloom.

* Bennett's Wanderings in New South Wales.

† Lindley in Botanical Register.

Look at its delicate little pink flowers growing in pairs, on opposite sides of the stem: and, what a pleasant smell they have!

MRS. F.

Yes; I have read that at Drontheim, and the neighboring parts, they are made into tea for medicinal purposes. Here, Henrietta, is another instance of the modesty of the great and learned. Linnæus, with the whole kingdom of Flora before him, choose this humble plant to perpetuate his name, and bore it over his helmet as a crest.*

HENRIETTA.

Thank you, aunt. How beautiful your Belladonna lilies are! and here are the Guernsey lilies also.

MRS. F.

Yes; the Belladonna, I find perfectly hardy. I leave it in the open ground all the winter, and it flowers finer every year. The Guernsey never blooms with us the second year. This lily is said to have been brought from Japan in a ship which was wrecked on the coast of Guernsey, whence it has been naturalised in that Island.

ESTHER.

What beautiful lines those are of Mrs. Tighe upon "the Lily, an emblem of Christian hope!" They begin —

"How wither'd, faded, seems the form
Of yon obscure unsightly root," &c.

I do not attempt to repeat them, for I cannot recollect them sufficiently, as the poem is rather long.

MRS. F.

Frederick, you should know this rose, for it is of classic interest. It is the Pæstan rose (*Rosa sempervirens*), which still grows at Pæstum, and I have gathered it myself among the ruins of three temples.

* Beckmann's History of Inventions.

MARY.

Which is the species from which the otto of roses is made?

MRS. F.

Otto of roses is made from the petals of the hundred-leaved rose (*Rosa centifolia*), which species is also used exclusively in the distillation of rose water. The genuine otto of roses is not, it is said, prepared by distillation, but by putting a quantity of carefully picked rose leaves into a clean jar or cask, with just sufficient water to cover them. The vessel is then set in the sun for a few days, and in about a week the otto (a butyraceous oil) collects in the form of a scum upon the surface, and is removed by a piece of cotton.*

Roses are also used in medicine. Confection of roses is made of the petals of the red rose (*Rosa gallica*), and Cónserve of hips from the pulp of the berries of the Dog-rose (*Rosa canina*).

ESTHER.

I have heard it said, that the dog-rose is so called from its fruit being eaten by dogs.

MRS. F.

So it is asserted; and certainly the rose being called by the same name in English, French, and Italian, and the hips being also, I am told, designated, among the Tartars, by a name signifying dog-fruit, seem to bear out the assertion: at the same time, I must say, I never heard of dogs eating them.

FREDERICK.

But, I have, aunt; for I have given the hips of the dog-rose to dogs, and they do not refuse to eat them, though they did not seem to care much about them.

MRS. F.

That these animals are often fond of fruit, I know by experience; for I have myself seen a dog gather the goose-

* Brande's Manual of Pharmacy.

berries from a gooseberry bush, and have heard of another who had a similar taste. House dogs will eat strawberries, grapes, and most kinds of fruits.



Grapes.

ESTHER.

That foxes will eat grapes, we have the testimony of Scripture, where Solomon speaks of the "little foxes that spoil the vines;"* and most travellers mention the depredations committed by these animals among the grapes. Jackals also, will destroy whole vineyards and gardens of cucumbers; and the "cottage in the vineyard," mentioned by Isaiah,† was doubtless a shelter for the watchmen, who were obliged to guard the vines from these nightly depredators.

MRS. F.

The Greek writers also mention the havoc committed by

* Solomon's Song, ii. 15.

† Isaiah, i. 8.

these animals; and Galen tells us, that the hunters used to eat the foxes in the autumn, after they had grown fat by feeding upon the grapes.

ESTHER.

And Theocritus says, complaining of their depredations,

“I hate those brush-tailed foxes, that each night
Spoil Micon’s vineyards with their deadly bite.”

MRS. F.

The lizard is a great depredator of the grapes in the island of Madeira, where rats and wasps are also very destructive. The lizard swarms in Madeira, and a traveller mentions a simple expedient by which numbers were caught. It was merely this: a brass kettle was placed upon the ground, into which the lizards fell when running about in quest of food. The smooth sides of the kettle prevented them from escaping, and thus numbers were taken without any difficulty. The same writer mentions a circumstance which refers to our original conversation respecting the dogs. It is this: that in the month of September, when the vintage begins, it is necessary to tie up all the dogs, these animals being so fond of grapes, that it is requisite to exclude them from the vineyards.

ESTHER.

Mamma, this *Solanum* is at last in bloom.



Solanum Sodomeum.

MRS. F.

So it is: it is interesting to me, because I gathered the seed at Pæstum; and this *Solanum* owes its specific name (*Sodomæum*) to its being supposed to produce the fabled apples of Sodom, or of the Dead Sea, which were fair without, and within ashes and bitterness. This plant may well merit such a designation; for the fruit is round, of a bright orange color, pleasing to the eye, but within dry and husky: and therefore no unfit representative of

— “The apples on the Dead Sea’s shore,
All ashes to the taste.”*

Or of the

“Dead Sea fruits, that tempt the eye,
But turn to ashes on the lips.”†

ESTHER.

Milton also alludes to the-apples of the Dead Sea, when he says,

— “Instead of fruit,
Chew’d bitter ashes.”‡

And Josephus mentions them, in his account of the Lake Asphaltites, as appearing fit to be eaten, but, if plucked with the hand, they dissolved into smoke and ashes.

HENRIETTA.

Aunt, how very fine your stocks are.

MRS. F.

Yes, they are very beautiful. I have the seed from Ham-
burgh.

ESTHER.

I have heard that the great secret in the superiority of the

* Childe Harold, iii. 34

† Moore.

‡ Paradise Lost, book x.

German seed is, that the gardeners keep it some years before they sell it.

HENRIETTA.

But how would that apply?

ESTHER.

In this manner; that by long keeping, the cotyledons or seed-leaves, destined to nourish the infant plant, become dried and injured, and give the less support to it. This checking vegetation, restrains the over-luxuriancy of the plant, which, instead of expanding itself in leaves, reserves its energies for the perfecting of the flower.

MRS. F.

Here is an *Onosma*, which is interesting, because I have read that it is by some chemical preparation of this plant that the priests delude the Neapolitans, by the supposed liquefaction of the blood of St. Januarius.

ESTHER.

In what manner, mamma?

MRS. F.

You are aware that, in a public annual ceremony at Naples, the blood of the saint becomes spontaneously liquefied, and rises bubbling to the top of the bottle which contains it. These illusions may be effected, by reddening sulphuric ether with orchanet (*Onosma*), and then saturating the tincture with spermaceti; this preparation is solid at ten degrees above the freezing point, and melts and boils at twenty degrees. To raise it to the latter temperature, it is sufficient to hold in the hand a few minutes the phial which contains it.*

MARY.

But do the priests really attempt to impose upon the people by such a deception?

* Salverte, des Sciences Occultes des Anciens.

MRS. F.

Indeed they do. I once witnessed the ceremony myself; and it is melancholy to see the eagerness with which the Neapolitans crowd round the altar and kiss this relic of the saint, which is enclosed in a richly chased case, with a glass on each side of it, something like a double watch-case, the bottle containing the blood, being placed in the centre, and viewed through the glasses.

HENRIETTA.

Poor creatures! how shocking it is to think of their superstition.

MRS. F.

But it should excite our sorrow rather than our indignation for "they do err, not knowing Scriptures."

ESTHER.

As Keble beautifully expresses it, in one of his hymns,* alluding to the Roman and Protestant Churches, —

"She mourns that tender hearts should bend
Before a meaner shrine,
And upon saint or angel spend
The love that should be Thine.

* * * * *

"And O! by all the pangs and fears
Fraternal spirits know,
When for an elder's shame the tears
Of wakeful anguish flow,

"Speak gently of our sister's fall;
Who knows but gentle love
May win her at our patient call,
The surer way to prove."

MRS. F.

Let such reflections, therefore, rather excite in our mind

* Gunpowder Treason.

the most lively feelings of gratitude that *our* lot is cast in a better land, in one where "the true light shineth," and which alike removed from Pagan ignorance and Romish errors, and gifted with every facility of religious instruction, may be truly designated as "The vineyard of the Lord."

CHAPTER XI.

ON LICHENS.

LICHENS. — OXALIC ACID. — TRIPE DE ROCHE. — ICELAND MOSS. —
 REINDEER MOSS. — CUDBEAR. — PERELLE. — ORCHILL. — LITMUS.
 — COCHINEAL. — CARMINE, &c. — TYRIAN PURPLE. — MUREX AND
 BUCCINUM. — ACCOUNT OF THE DYE. — FABLE OF ITS DISCOVERY.
 — ROYAL COLOR. — HYACINTHINE CURLS. — MARTAGON LILY. —
 MOLLUSCA. — FORMATION OF SHELLS. — SEPIA. — INDIAN INK. —
 POLYPUS AND KRAKEN. — EIGHT-ARMED CUTTLEFISH. — NAUTILUS.
 — CHAMA. — PINNA AND PINNOPHYLAX.

"Rocks sublime
 To human art a sportive semblance bore,
 And yellow lichens color'd all the clime
 Like moonlight battlements and towers decay'd by time."
 CAMPBELL.

ESTHER.

MAMMA, when you were telling us, the other day, the
 properties of the different *Algæ*, you were so kind as to
 promise to describe the uses of the other orders of Crypto-
 gamia.

MRS. F.

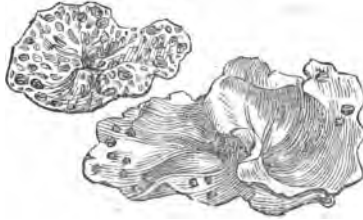
That I will, with pleasure, though my cryptogamic know-
 ledge is so limited that I cannot, I fear, give you so full
 an account as I could wish. However, suppose we select
 the *Lichens* for to-day's conversation.

ESTHER.

Thank you.

MRS. F.

In the arts, and in domestic economy, many of this order are most useful. A species of one genus (*Variolaria faginea*) contains oxalic acid so largely, that it is now employed in France on an extensive scale for its production.* Then, as an article of food, the lichens produce the *Tripe de Roche* (*Gyrophora* genus), which is so much eaten by the Canadian hunters, and which proved so serviceable to Sir John Franklin and his brave companions during a season of want to which few have been subjected; but it is very bitter and nauseous, and can only be employed in the absence of more salutary food.



Tripe de Roche.

ESTHER.

Is not the Iceland moss also a lichen?



Iceland Moss.

* Hooker, in vol. v. of English Flora, from which much of this is taken.

MRS. F.

Yes; the Iceland moss (*Cetraria Islandica*), which we procure principally from Norway and Iceland, is also abundant in certain districts in Scotland, but it has never been yet collected there, as an article of commerce. Independent of its medicinal use in coughs and consumptions, it is also gathered in Iceland, in immense quantities, as an article of common food. The bitter quality being first extracted by steeping in water, the lichen is dried, reduced to powder, and made into a cake; or it is boiled and eaten with milk, and eaten with thankfulness too, by the poor natives, who confess "that a bountiful Providence sends them bread out of the very stones."



Reindeer Moss.

The reindeer moss (*Cladonia rangiferina*) must also be enumerated among the most valuable of the lichens. It is an inhabitant of almost every part of the world, even of the tropics, but in the colder and arctic regions, it is most abundant. It is this which, for the greater part of the year, and especially in winter, is the support of the vast herds of reindeer wherein consists all the wealth of the Laplander. No vegetable, Linnæus tell us, grows throughout Lapland in such abundance as this, especially in woods of scattered pines, where, for very many miles together, the surface of the sterile soil is covered with it, as with snow. On the destruction of forests by fire, where no other plant will find nutriment, this

lichen springs up and flourishes, and, after a few years, acquires its full size.



The Reindeer.

Here the reindeer are pastured: and whatever may be the depth of the snow during the long winters of that climate, these creatures have the power of penetrating it, and obtaining their necessary food, by scraping away the snow with their hoofs. The Laplander also feeds his reindeer upon *Alectoria* and other succulent lichens, which hang in long filaments from the trees, which he cuts down, in order that the reindeer may more easily get at their favorite food. — There now remains for me to mention one other use to which the lichens are applied, and that is, dyeing, where the coloring matter, in which they abound, is employed to great advantage. One genus (*Evernia prunastri*) was used during the war (instead of gum) in calico printing, but it afterwards fell into disuse, as a very inferior substitute.

ESTHER.

Is not the Cudbear, which is used to color silk stockings, a lichen?

MRS. F.

Yes; *Lecanora tartarea* is its botanical appellation.

FREDERICK.

But why is it called *cudbear*?

MRS. F.

From a Mr. Cuthbert, who first brought it into use. It is employed to produce a purple for dying woollen yarn; and is used for that purpose, to a great extent, at Glasgow. It grows in Sicily and Norway, and from the latter country, it is mostly imported; but it is also abundant in parts of Scotland, and many an industrious Highlander gains a living by scraping off this lichen with an iron hoop, and sending it to the Glasgow market. The French *Perelle*, which comes from Auvergne and other parts of France, is a kindred species of the same genus (*Lecanora Parella*), but it produces a dye far superior to cudbear, and quite equal to that of Archill (*Roccella tinctoria*), to which we are now come.*

FREDERICK.

That too is a singular name.

MRS. F.

Its several appellations of Roccella, Orceille, Archill, Orchill, are derived from a Florentine family of the Oricellarii, Rucellarii, or Rucellai, one of whom carried on a considerable trade in the Levant, and returning with great wealth to Florence, first made known in Europe the art of dyeing with this plant, which was exported from the islands of the Archipelago. This interesting lichen yields the most valuable dye of this tribe; it is found on steep rocks of the Scilly Islands, and in the south of England, but it is far more abundantly produced in warm climates, and particularly in the Cape de Verd and Canary Islands, whence it has also been called the Canary weed, and where it was discovered towards the commencement of the last century, and soon placed among the royal monopolies of the Spanish crown. Its value quickly excited the attention of the Portuguese, who collected it without restriction, in the Cape de Verd Islands, Madeira, Porto Santo, and the Azores, until the Jesuits, in 1730, procured from John V, the privilege of collecting it. The

* Several species of *Parmelia* are also collected by the Scotch peasantry to dye woollen stuffs a dirty purple.

Crown afterwards assumed the right to itself, and, at one time, it was considered to be the Queen of Portugal's pin-money;* but it was afterwards ceded to a mercantile company until, by its bad management, the commerce had so much declined that the Government again took it into its own hands in 1790, and now they only allow it to be sent to Lisbon. It grows in the crevices of steep rocks, in the interior of the islands. The finest is collected in St. Antonio, where it grows in some places so inaccessible as only to be procured by lowering the gatherer down with ropes. But the great consumption of it of late years has caused the finest quality of it to become scarce.†

HENRIETTA.

What is it chiefly used for?

MRS. F.

The English blue broad-cloths are first dyed with Orchill, which gives their peculiar lustre and purple tint, when viewed in a certain light; and, it may also be useful to you to know, that Orchill is manufactured by the Dutch, into a paste called *Litmus*, of which you will often hear in chemical experiments. When infused in water, or when paper is stained with Litmus, it is employed as the most delicate test for detecting the presence of acids and alkalis; the acid turns it red, the alkali restores it to its original blue color. Orchill is also used for dyeing silk and ribands; but its blue, though beautiful, is perishable. Some writers have endeavored to prove, that the celebrated Tyrian purple was produced from this substance, the lichen being abundant on the Phœnician coast; but we have full evidence to the contrary.

ESTHER.

Might not the purple have been made from Cochineal?

MRS. F.

No; the ancients were unacquainted with this insect,

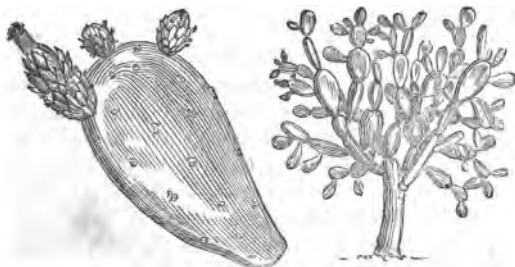
* Bowdich's Madeira.

† Canary orchill is most esteemed, then that from Madeira, and the Barbary is least valued of all.

although they employed that of the Evergreen oak or Ilex,* called by the Arabians *kermes*, whence *karmasinus*, the French *cramoisi*, and our *crimson* and *carmine*. The *kermes* was used to dye scarlet, and was known to the Egyptians, in the time of Moses, and to the Phœnicians, at even an earlier period. The latter people termed it *Thola* or *Tola*, the Greeks *Coccus*; from which name, and from the epithet *vermiculatum* (given to it when it was ascertained to be the produce of a worm), have sprung the Latin *coccineus*, the French *vermeil*, and our *cochineal* and *vermilion*.†

FREDERICK.

What does our cochineal come from?



Cactus Coccinellifer.

MRS. F.

It is an insect called *Coccus cacti*, or of the Cactus, because it is parasitical upon that family of plants. It only exists in Mexico, where the Spaniards found it employed as a dye, on their arrival in 1518. It has ever since been one of the greatest sources of wealth, and De Humboldt estimates the value of its annual exportation at 500,000*l*. Although the East India Company have offered 60,000*l*. to any one who shall introduce the insect into India, they have hitherto been unable to procure any, except the wild species from Brazil.

* *Coccus ilicis*, *i. e.* of the *ilex*.

† Kirby and Spence; Dictionnaire des Sciences Naturelles, &c.

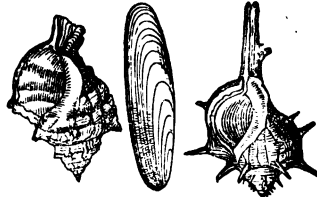
But, we have widely digressed from the Tyrian purple, which, I was about to tell you, we know to have been produced by a fish.

HENRIETTA.

On what authority?

MRS. F.

Upon that of Pliny, who states that there were two species of mollusca which afforded it; the one a tolerably large animal, which Linnæus supposes to have been *Murex trunculus*, and Cuvier *Murex brandarus*. You all of you know the Murex?



Murex Trunculus, *Murex Brandanus*, &c.

ESTHER.

They are what we call the *Rockshells*.

MRS. F.

The other animal employed was a *Buccinum*.

ESTHER.

That is the genus which we term *Whelks*.

MRS. F.

Exactly so; which species was used, is not exactly known. Linnæus assigns the distinction to *Buccinum lapillus*, which is one of the commonest of our British shells; but many of this family afford a coloring matter, as do several others of the univalve shells — such as *Helix Janthina*, which, when touched, emits a purple liquor that tinges the sea around it. This *Buccinum* produced a color resembling the Murex,

though not precisely the same. The shells are said to have been taken by an ingenious contrivance; the nets were baited with mussels which were half dead, and their shells consequently partly open; the fish pushed its trunk into the shell in order to draw out its prey, upon which the mussel closed entirely, and thus detained its prisoner.

ESTHER.

Were there not several tints of this dye?

MRS. F.

Yes; the various kinds were produced by using different proportions of the two fish. To obtain the color called *ame-thyst*, we read that 100lbs. of the *purple*, and 200lbs. of the *Buccinum* were mixed together, and this enormous quantity of fish only served to dye fifty pounds of wool.

ESTHER.

How was that tint mixed which was called the Tyrian purple?

MRS. F.

The wool was first dipped into the *Murex* and then into the *Buccinum*; and by this means, was obtained the finest color, which appears, from what we read, to have had a kind of *shot* appearance, blackish when viewed in front, but brilliant when seen on the side. Frederick, you may recollect that Horace alludes to the double dyeing of the purple, when he says (2d Book, 16th Ode), as rendered by Francis in his translation:

“Thy robes the *twice*-dyed purple stains.”

ESTHER.

It was the custom to crush the *Murex* as soon as taken, for, if kept, the animal ejected its purple dye.

MRS. F.

Aristotle tells us that a single shell sold for about 3*l*.; but as it appears that only a single drop of the dye was produced

from each animal, it is not surprising that it was so dear. The Murex is still used, in a small way, for the purpose of dyeing, in India and Armenia. Vast heaps of fragments of shells have been found at Tarentum, which are supposed to be those from which the purple has been extracted, and which would seem to indicate that place, as one where it was prepared.

MARY.

How came the ancients to discover that these fish produced a dye?

MRS. F.

Like most of their discoveries, they have assigned to it a fabulous origin.

FREDERICK.

We should like, aunt, to hear it.

MRS. F.

They say that the dog of Hercules having stained its mouth by eating the animal of a shell, which it picked up, on the sea shore, Tyras was so struck with the beauty of the color, that she declared she would not see Hercules, until he had procured her a robe of that hue. Hercules therefore collected all the shells which he could find, and dyed a garment of the purple. According to this account, the discovery is placed at about 1500 years before the birth of our Saviour; but there are various fables attached to the discovery of this dye, some assigning it to Phœnix, second king of Tyre, who lived about B. C. 500; but all these accounts are, we must conclude, enveloped in fiction, though all concur in attributing to accident the original discovery. In all ages purple has been a royal color. Moses used purple stuffs for the furniture of the tabernacle, and for the dress of the high priests. Many of the pagans believed that the dye had a peculiar virtue, and was capable of appeasing the wrath of their gods. The Babylonians gave purple habits to their idols; the kings of Phœnicia were always attired in purple; and the Roman em-

perors took to themselves the exclusive privilege of wearing this color, by an imperial decree, by which its use was restricted, under pain of death, to the emperor. Hence the expression of "assuming the purple" became synonymous with that of ascending the throne. The emperors appointed officers to superintend the Phœnician manufactures, and a pound of Tyrian dye sold, in the reign of Augustus, for a sum almost equal to 36*l.* of our present money.

MARY.

What a beautiful rich color it must have been.

MRS. F.

It was undoubtedly the finest then known; but, after all, the best colors that could be made by the ancients, were but poor and dingy, compared with those which the moderns, by the assistance of chemistry, are able to produce. Pliny says that the Tyrian purple resembled in color congealed blood.

FREDERICK.

Then that is the reason why Homer and other poets talk so much of purple blood — an expression which I could never understand, any more than I can that of "hyacinthine locks;" for no hyacinth is the color of the human hair.

MRS. F.

According to Lord Byron, the term is common enough among the Eastern, as well as the Greek poets; but the expression is not, as you imagine, derived from the color of the flower, but from the form of its petals, which are curled outwards, and may be thought to bear some fancied resemblance to the curls of the hair.

HENRIETTA.

Thank you, aunt, I am sure that we never should have thought of such an explanation.

ESTHER.

Pray, mamma, is not the red Martagon Lily supposed by many to have been the hyacinth of ancient mythology?

MRS. F.

You are right, Esther; and let us hear from you, the reasons for this conclusion.

ESTHER.

According to the fable, when Apollo changed the blood of Hyacinthus into a flower, he inscribed the characters *Ai* upon its petals. Now the flowers of our hyacinth (independent of the color being different from that assigned to the hyacinth of the ancients) has no spots whatever upon the petals, whereas, on the other hand, by some assistance from the imagination, these letters may be traced in the dark, blackish spots of the Martagon lily,* with which, in other respects, the description of the ancient Hyacinth coincides, it being described of an iron red or Roman purple, which is the color of the common Martagon; and the curling of the petals, being common to both flowers, there can be no objection on that point.

MARY.

I did not like to interrupt you just now; but what did you mean, mamma, by calling the shells which produce the purple *mollusca*?

MRS. F.

It was the animal they contain, which I so called, not the shell, which is merely its covering. Mollusca form one of Cuvier's four great divisions† of the animal kingdom, and are defined to be without a skeleton, with white blood, their muscles attached only to their skin, which forms a soft retractile covering, on which, in many species, are produced those strong plates which we call shells.

HENRIETTA.

Then this is conchology.

* Martyn.

† He divides the animal kingdom into vertebrated, molluscous, articulated, and radiated animals.

MRS. F.

Not so, for conchology implies the knowledge of shells; but all mollusca have not this kind of covering. Those which have, are called testaceous, from the Latin *testa*, a shell. Conchology, therefore, may be defined as the classification of the testaceous mollusca, according to the forms of their shells, and is consequently a very distinct science from that of the knowledge of molluscous animals.

MARY.

Pray, mamma, what are shells made of?

MRS. F.

Like the bones of vertebrated animals, they are composed of a calcareous substance, almost as heavy and as hard as marble, which substance is produced in layers. In proportion as the animal increases in age, it forms a new layer on the inner surface of the shell, which extending beyond the edge of the preceding layer, increases the size of the shell in length, breadth, and thickness.

HENRIETTA.

But how can naturalists ascertain this point?

MRS. F.

By comparing the shells of the same species of animals of different ages; as for example, the mussel, in which the old shell is seen to be composed of many distinct layers; whereas that of the young animal only consists at first of one stratum, not soft and gelatinous, but equally firm as the old shell, though, of course, more fragile, on account of its thinness.

ESTHER.

Then slugs and the cuttle fish, for instance, are both mollusca, although they would not be mentioned in a work on conchology.

MRS. F.

Yes; but the last contain a calcareous substance within

the flesh of the back, which may fairly be termed an internal shell.*

HENRIETTA.

Is that what we call cuttle-bone?

MRS. F.

It is; this substance being friable in its structure is used for polishing; and I do not know whether you observed that Mrs. Clifford gives it to her young canary birds to sharpen their beaks. The cuttle-fish are enabled to throw out an inky liquor, in order to form a thick cloud around them, by means of which they conceal themselves from their enemies; or, as some suppose, lie in ambush for their prey. You all know what is made of this liquor?

HENRIETTA.

The color called Sepia, which we use in drawing.

FREDERICK.

And also Indian Ink.

MRS. F.

Of this, we are not so sure, Frederick. The present opinion is, that Indian ink is prepared by the Chinese from lamp-black, mixed with gum, and rendered aromatic by some, as yet, unascertained substance. Sepia seems sometimes to have been used as ink by the ancients; but, I believe, that they more frequently employed charcoal. The ink of the ancients was more easily obliterated than ours, as appears from a story of Caligula, who is said to have forced those who wrote any thing against him to lick it out with their tongues.† In the Museum at Naples, is a pentagonal ink-stand, not much unlike those in modern use. But to return to the Sepia; the flesh of these animals was much esteemed by the ancients, and is still eaten in Italy.

* To this the bone of the Calmar (*Sepia loligo*) bears some resemblance. We find a horny, hollow, flat shell in the *Aplysia*, and the slug also has a small internal shell.

† Sir William Gell.

HENRIETTA.

But it cannot be good.

MRS. F.

On the contrary, it is particularly delicate. It is cut into thin strips and fried, when it much resembles lobster; we used often to eat it at Naples, and liked it very much;* though, I confess, that were we to have seen it before it was cooked, we might have felt less disposed to taste it.

HENRIETTA.

I should think so, aunt; for the cuttle-fish is such a very disagreeable looking animal that I could never make up my mind to eat it.

MARY.

What is it like?

HENRIETTA.

I once saw one, when we were staying by the sea-side. It is about a foot long, of a soft, white substance, and its mouth is placed in the centre of its feet, and is exactly like the beak of a parrot.

MRS. F.

With this powerful weapon, the Sepia destroy a great many fish and crustacea. They belong to the class *Cephalopoda* of Cuvier, which is remarkable, as being the only class of Mollusca which possess the organ of hearing.

HENRIETTA.

What, have not all Mollusca the five senses?

MRS. F.

No; they only possess those of taste and sight, except in this class, which has the additional faculty of hearing. The Nautilus and Argonaut belong to the same class; but I wish to know, if any of you have heard of the eight-armed cuttle

* Several of this genus are eaten in Italy.

fish (*Sepia octopodia*), the celebrated *Polypus* of the ancients, and by some authors, supposed to be the animal which they called the Kraken?

HENRIETTA.

But the Kraken is the wonderful American sea monster.

MRS. F.

True; the story has been revived by American navigators. Pliny gives an account of an animal which ravaged the coasts of Bœtica. It used to leave the sea, had arms thirty feet long, and was at last killed by men and dogs, and sent as a present to Lucullus. Ælian, also, is equally marvellous in his stories about this animal.

FREDERICK.

But I suppose that all this is quite fabulous?

MRS. F.

Perhaps not entirely so, for such tales are seldom invented without some foundation. The ancient accounts of the *Polypus*, the stories of the Kraken, and the reports of the Norwegian Sea Serpent, all tend to prove the existence of some enormously large animal in the Indian and Northern seas. To none can the description better apply, than to the *Sepia octopodia*, which is furnished with arms six times longer than its body, and is known to attain so great a size, and at the same time, to possess so much strength, as only to be approached with caution. In the Indian seas, where Pennant says he has been assured that they have been found with arms nine fathoms (54 feet) long, the islanders, when sailing in their narrow canoes, are said always to go provided with hatchets, in order to cut off the arms of these animals, which they throw on each side of the canoe, and by this means, drag it under water and sink it. Expert swimmers have often perished, by the animal entwining its arms around them and thus drawing them under water. A northern navigator, Captain Magnus Deus, is said to have lost three men in this manner: but for the veracity of these statements we do not

pretend to vouch; we only allude to them, because they go to prove, that some enormous Cephalopoda is frequently met with, which credulous navigators have readily transformed into this extraordinary monster.*

ESTHER.

'Did you not say, mamma, that the Paper Nautilus (*Argonauta argo*) belongs to the family of Cephalopoda?

MRS. F.

I did say so. I suppose you have all seen pictures of this animal skimming on the surface of the water, erecting its two largest tentacula (or arms) for sails, employing the other six as oars, and its shell as a boat? Nothing, I should think, can present a prettier sight. In fine weather they are to be seen in troops in the Mediterranean, but descend immediately on the approach of rough weather, or of danger. In order to effect this, the Nautilus draws in water to add to its weight, and thus is enabled to sink into the depths of the ocean. When it wants to re-ascend, it diminishes the specific gravity of its shell by ejecting the water, and thus again rises to the surface of the sea. The *Argonauta argo* does not appear to adhere to its shell, whence many naturalists have imagined that the animal which inhabits it, is parasitic, occupying, like the hermit crab (*Cancer Bernhardus*), the shell of another. But, as this animal is always found in this shell, and no other has ever been seen to inhabit it, although the shell is common, and often seen on the surface of the sea, we have every reason to deem this opinion to be highly problematic.

MARY.

Pray, mamma, what is that enormous shell which Mrs. Clifford has in her hot-house to hold some of the smaller kinds of water plants?

MRS. F.

It is the *Chama gigas*, a shell which sometimes attains an

* Dictionnaire des Sciences Naturelles, &c.

immense size, and is, I believe, the largest species known. The flesh of the animal is eatable, but is very hard. Several individuals have been found which weighed more than 300lbs. The French call these shells *Bénitiers*, because they are used to hold the holy water; and there are two in the church of St. Sulpice in Paris, (where they are applied to that purpose,) which were presented to Francis I, by the republic of Venice. These shells are furnished with a byssus or beard, by which they are suspended to the rocks, and which is so thick and tenacious, as only to be separated with a hatchet.

ESTHER.

Does it resemble that of the Pinna?

MRS. F.

It is not so silky, for the byssus of the Pinna (*Pinna nobilis*) is woven into gloves, &c.

ESTHER.

How is it prepared for that purpose?

MRS. F.

The byssus (which will not take any dye) being cut, is twice soaked in tepid water, and once in soap and water, and is then spread out to dry, in some cool and shady place. While it is yet moist, it is rubbed softly and separated with the hand, and then spread out again. When thoroughly freed from moisture, it is next drawn through a wide-toothed comb, and afterwards through one with finer and closer teeth. The more common silk is thus prepared; but, that which is destined for finer works, is afterwards drawn through closer toothed combs or cards. It is next spun, two or three of the threads being mixed with one of real silk, and then knitted. When knitted, it is again washed in clear water mixed with lemon juice, is then gently beaten between the hands, and afterwards smoothed with a warm iron.

HENRIETTA.

How does the Pinna spin its byssus?

MRS. F.

As all other byssus-spinning mollusca, viz. by means of its foot; the spinnerets of the spider are in its tail, those of the silk-worm and other spinning moths in the mouth; Providence having beautifully arranged their situation in each as is best adapted to the wants and convenience of the animal.

ESTHER.

Is the anecdote about the Pinna, and its parasite, true, which I have read in extracts from Dr. Darwin's poems?

MRS. F.

And which is the same as the Pinnophylax of Pliny? No; I believe it to be fabulous, excepting so far, that small crustacea, indeed both crabs and shrimps, will find their way into the shell of the Pinna, the Mussel, or the Whelk; not with any view of hurting the animal, but in order to defend themselves, especially when their crust is soft, and they are the more exposed to injury from the attacks of their enemies.

CHAPTER XII.

THE FOOD OF VARIOUS NATIONS.

EARTH EATEN BY THE OTTOMACOS, PEOPLE OF NEW GUINEA, NEW CALEDONIA, PERU, JAVA, ETC.—STEINBUTTER.—GIRDLE OF FAMINE.—
 — ERMINE HUNTERS. — GUM ARABIC. — TARTAR'S CURD. — FISH-BREAD OF BABYLONIANS AND SOUTH AMERICANS. — FOOD OF ANTS, BEES, SPIDERS, LOCUSTS, AND BOAS.—BUGONG MOTH.—GOAT MOTH.—
 — PALM WORMS. — CHINESE. — SHARK'S FINS. — BICHE DE MER. —
 — SNAILS. — ESCARGATOIRES. — SIR K. DIGBY.—ISRAELITES. —
 HYBERNATION OF THE SNAIL. — SAW-DUST. — SHELL OF THE SNAIL.

Requiring each to gratify his taste
 With different food.

FRANCIS'S HORACE.

MRS. F.

I HAVE just been reading a curious account of the Ottomacos, the earth-eating tribe of the Orinoco.*

HENRIETTA.

Pray, aunt, tell us what you have read.

MRS. F.

These people collect, from the shores of the rivers Meta and Orinoco, upon which they live, a fat, unctuous clay of a grayish, yellow hue (a true potter's clay, colored by a little oxide of iron). This they select with great care, being able readily to distinguish, by the taste, one clay from another.— They then form it into balls of from five to six inches in diame-

* Humboldt, Tableaux de la Nature.

ter, and bake them slightly, until the upper surface becomes reddish. It is again moistened when they wish to eat it. — The Ottomacos devour immense quantities of earth; Humboldt found it in their huts piled up in pyramids, and he says, that each individual will consume daily, three-quarters of a pound, or even more.

ESTHER.

But is it their sole food?

MRS. F.

During the rainy season, they also eat small fish, lizards, or the root of a fern, but these clay bullets form their chief aliment. At other times of the year they subsist on tortoises and fish, which they shoot with their arrows with admirable address; but so fond are they of this clay, that even then, they eat a little of it, as a treat after their repasts.

ESTHER.

But surely, their health must suffer from such unnatural food?

MRS. F.

No; the Missionaries who live among them, assert that it causes no illness whatever, and that they observe no difference in their health during the time that they live upon it. But this extraordinary propensity to eat earth, is by no means uncommon in all the countries of the torrid zone; and children are often tied up in the house to prevent them from going out, after the rainy season, to eat earth. De Humboldt, in a village, on the river Magdalena, saw women, who were making earthen pots, put large lumps of the clay into their mouths.

ESTHER.

And I have heard that the negroes of New Guinea eat a yellowish earth, and that the slaves when brought to America try to procure a similar enjoyment, and that it is sold secretly in the markets; but though their health always suffers in consequence, no punishment can induce them to relinquish the gratification.

MRS. F.

But it were almost tedious to enumerate the various people who eat earth. The inhabitants of New Caledonia devour pieces as large as the hand, of a species Oolite. In several parts of Peru, the natives buy in the markets a calcareous earth, which they reduce to a fine powder, and mix with their Coca.

HENRIETTA.

What is *Coca*?

MRS. F.

The leaves of *Erythroxylon Peruvianum*; and it is known that the Indian messengers do not take, for many days, any nourishment but this.

ESTHER.

But chalk has not been yet found in either North or South America.*

MRS. F.

No, it is all imported; but it was a calcareous earth, not chalk, upon which I stated, that these people subsist. In Java, little rolls of a reddish clay are sold in the market-place under the name of *Ampo*. Many eat it to become thin, which is reckoned a great beauty among the Javanese; and even in Germany, the workmen in the free-stone quarries of Kiffhäuser spread upon their bread, instead of butter, a very fine clay which they term *steinbutter* (stone butter). Thus we see this vitiated taste widely diffused; but more particularly among those indolent races of the torrid zone, upon whom Providence has lavished her greatest treasures.

ESTHER.

Animals, when reduced by famine, will eat earth.

MRS. C.

Yes, wolves have been known to devour clay; but did you

* Conybeare and Phillips.

ever hear the expedient that the Hottentots have recourse to, in order to allay the feeling of hunger? They tighten the girdle which they wear round the waist, and this they term "tightening the girdle of famine."*

ESTHER.

But that is not a singular instance of this means being employed. The ermine hunters of Siberia are said to undergo most dreadful sufferings from hunger. It appears, that in order to defend their provisions from wild beasts, and not being able to carry them along with them, they dig holes in the ground, and bury them, at such stated distances as they think they will require them. But sometimes these depots are discovered and plundered by the bears; at others, they do not reach their fresh supplies at the expected times. To obviate the inconvenience which these accidents may occasion, each hunter is furnished with two flat boards which they attach round their waists, and which they tighten considerably, in order to alleviate the gnawing sensations which they experience.

HENRIETTA.

Poor creatures!

MRS. F.

Many of the wandering tribes subsist, during their passage across the African desert, upon the gum of an acacia (*A. vera*. Willdenow).

ESTHER.

That, I believe, is the same plant as that which produces gum arabic; the finest of which is brought in caravans to Cairo, by the Arabs who live round Mount Tor and Mount Sinai.

MRS. F.

The diet of the Tartars, when on a hasty march, is scanty enough; for on sudden emergencies they provide themselves

* Thomson's Travels in the Cape of Good Hope.

with a sufficient number of little balls of cheese, or rather of hard curd, which they occasionally dissolve in water; and this unsubstantial meal will support for many days the life, and even the spirits of the patient warrior.*

FREDERICK.

Herodotus mentions a tribe of Babylonians who dried their fish in the sun, then beat it very small in a mortar, sifted it through a fine cloth, and formed it into cakes, and baked it like bread.†

MRS. F.

That is very much the manner which some of the Indians of the Orinoco still pursue. They fry their fish, dry it in the sun, and reduce it, bones and all, to a powder. When they wish to eat it, they mix water with it, to make into a paste, which they call "*manioc de pescado*," or fish bread.‡ But did you ever hear of ants being eaten?

ESTHER.

Yes; the Hottentots eat them both boiled and uncooked; the Africans parch them in an iron pot, stirring them about, as is done in roasting coffee. In this state they eat them as we do comfits; and a traveller§ who tasted them, says that they are very nourishing and wholesome; in taste, much resembling sugared cream, or sweet almond paste. In some parts of Sweden, ants are distilled with rye, to flavor the inferior kinds of brandy;|| and Sir Stamford Raffles states that white ants are a common article of food in Java,¶ and that they are sold generally in the public market. Their extensive nests are opened to take out the chrysalis; or they are watched and swarms of the perfect insect are conducted into basins or trays, containing a little water, in which they soon perish.

* Gibbon.

† Clio.

‡ Humboldt.

§ Smeathman.

|| Kirby and Spence's Entomology.

¶ History of Java, vol. i.

HENRIETTA.

I cannot fancy people eating such things.

MRS. F.

Nor would you probably like bees, which are eating in Ceylon, or spiders (*Aranea edulis*) nearly an inch long, which a traveller* relates that the inhabitants of New Caledonia eat with avidity, and roast over the fire. Lalande is said to have been equally fond of these strange dainties and mention is made of a German who would spread them upon his bread like butter.

FREDERICK.

And then there are the Locusts, which were eaten by the Parthians.

ESTHER.

And also at Mecca, where in times of scarcity they are pounded and mixed with flour for bread, or fricasseed in butter. The Hottentots make them into soup, and find them fattening; so do they also in the Mahratta country. The Moors sometimes eat two or three hundred locusts at a time; and in the markets even of Greece, they appear to have been exposed for sale.

FREDERICK.

But the Greeks used to eat crickets.

ESTHER.

They could not have been very good; Humboldt states that he saw the Indian children drag centipedes eighteen inches long, out of the earth, and devour them.

MRS. F.

Some nations also eat serpents. Stedman says that the negroes wanted to eat one that he shot, and the negroes of Congo and Angola feast upon the boas, and prefer them to

* Labillardière.

poultry. Shaw also states, that a population of 40,000 people at Cairo, live upon lizards and serpents as a species of self-mortification. But did you ever hear of a people who ate moths?

HENRIETTA. -

No, aunt; we shall be much obliged to you to give us an account of them.

MRS. F.

This moth (*Euplœa hamata*) is found in New South Wales, chiefly on the Bugong mountains, where it assembles in multitudes, whether for the purpose of migration, is not yet ascertained, but immense swarms of butterflies, covering a space to the extent of three or four acres, were seen by captain Cook; and captain King also relates that they congregated in great numbers. The bodies of the moths are large, and filled with a yellowish oil, in taste much resembling a sweet nut. November, December, and January, are the months for collecting them; and this period is a season of such great feasting to the aborigines, that they assemble, from all parts of the country, to collect the moths on these mountains where they are found upon the masses of granite, as many as five or six bushels being gathered upon a rock. The natives make smothered fires underneath the rocks where they are collected, and thus suffocate them with smoke, at the same time sweeping them off frequently in baskets full at a time. After they have collected a sufficient quantity, they are thus prepared:—a circular space is cleared upon the ground, and on it a fire is lighted, which is kept burning until the ground is sufficiently heated, when the fire and ashes are removed, and moths placed upon the heated ground, and stirred about until the down and wings are removed from them; they are then placed upon pieces of bark, and winnowed in order to separate the wings and dust, which are mixed with the bodies. They are afterwards either eaten, or placed into a wooden vessel, and pounded into masses or cakes, resembling lumps of fat, or rather dough, which has been

discolored. These masses will hardly keep a week, unless smoked, when they can be preserved to a much longer period. With these, the native tribes load themselves during the season of feasting, and thrive and fatten upon this strange nourishment. The Bugong moth is also a great favorite with the cows, who often dispute their possession with the natives.*

ESTHER.

Thank you, mamma. I never before heard of a moth being eaten in its perfect state, though the caterpillar of the Goat moth is supposed to have been eaten by the Romans, and the Chinese eat the chrysalis of the silk-worm, after having wound off the silk.

MRS. F.

Fried grasshoppers and silk-worms are preferred by the inhabitants of Madagascar to any other food; and then there is the Grugru worm of the cabbage palm, and the worms furnished to the Javanese by the teak and other trees; but I really believe, that the Chinese eat more strange animals, than any other civilised nation in the world. Dogs† and cats are made into soups; and rats are also eaten by them,‡ if we may credit a recent account, § rved up with worm sauce.

ESTHER.

The South Americans used to eat the mute dogs of their country, at the time of the arrival of the Spaniards, and so, I believe, do the Tartars;§ but, speaking of the Chinese, I find that they eat the fins and tail of the shark, which are very glutinous, and are, indeed, much liked by our seamen. When dried, they form an article of commerce to China, where they are used in soups. The shark is also eagerly aten by the natives of the Polynesian islands, who often feast upon it in a raw state.

* Bennett's Wanderings in New South Wales.

† Dogs are also much eaten on the Gold Coast.

‡ Bennett's Wanderings in New South Wales.

§ Humboldt.

MRS. F.

Then there are birds' nests, which we have before alluded to, and also the *biche* or *bearche de mer*.

HENRIETTA.

What is that?

MRS. F.

It is now ascertained to be a species of Sea Slug (*Holothurix*); which is dried and used in the dishes of the Chinese, being collected on the shores of nearly all the islands of the Indian Archipelago and New Holland. It sells in China at a high price; but as it requires great care, and the smell of it, moreover, is very disagreeable, it seldom forms part of the cargo of an European vessel.*

HENRIETTA.

Well, that is not worse than the snails which some people eat.

MRS. F.

This tribe of animals is a general article of food. The Romans had their *Cochlearia*, in which they were fed upon bran and wine until they attained an incredible size.† The Ashantees eat snails after they have been smoke-dried.‡ In several provinces of France, at Liege, in Silesia, Brabant, Switzerland, and Italy, they are also eaten as food; and in the markets of most of the great cities of the Continent they are sold to make a mucilaginous broth for those who are attacked with affections of the lungs. The places in which they are fattened are termed *escargatoires*, *escargot* being the French appellation of the edible snail (*Helix pomatia*). One of these fattening places has been described to me, which exists in a convent on the lake of Starenberg, in Bavaria. It resembles, in construction, one of our garden brick pits; and on removing the cover, hundreds of these creatures were

* Raffles's Java, and Beechey's Voyage.

† Varro says, until a shell would hold two quarts!

‡ Bowdich.

to be seen, which were regularly fed with cabbages and other vegetables until sufficiently fattened to be brought to market.

ESTHER.

Is the eatable snail a native of Great Britain?

MRS. F.

No; but it has been naturalised in parts of Surrey, and, I believe, Northamptonshire. On the downs near Croyden, it is of common occurrence. Tradition assigns the importation of these snails to Sir Kenelm Digby, who is said to have introduced them, to cure his wife of a consumption. I believe that attempts have been made to naturalise them in other parts of the country, but without success. This species is much larger than the garden snail, and the shell is of a pretty light brown.

ESTHER.

I have somewhere read, that snails are supposed to have been eaten by the Israelites, in their rapid flight out of Egypt to the Red Sea.

MRS. F.

That is a supposition which must rest upon mere conjecture, as there is no mention of snails in the Pentateuch, to warrant the assertion. It is true, that the country about the Red Sea is covered with a close herbage completely animated with snails, which are much esteemed by the natives; and so abundantly is this genus diffused, that, even in the most desert wastes, in parts of Sahara, which is destitute of all kinds of vegetation, except here and there a tuft of grass, or a solitary stunted tree, which seems to realise the description of the Psalmist, "that withereth before it groweth up;" yet, even these parched specimens of vegetation, have their inhabitants, and are sometimes quite studded with the snails which exist on this scanty nourishment.

ESTHER.

The natural history of the snail is most interesting. It

lays its eggs in shady places, in hollows which it excavates and covers with its foot; the young at first lives entirely upon the pellicle or thin skin of the egg, and remains concealed in its retreat a month before its shell is sufficiently hardened to encounter its enemies. When the first chills of autumn approach, the snail prepares its winter habitation.

FREDERICK.

How is that made?

ESTHER.

In this manner. A quantity of viscid mucus or slime is secreted in the under surface of the foot, to which a large portion of the dead leaves adheres. This is turned on one side, and a fresh secretion being thrown out, the layer of earth mixed with mucus, is left. The animal then takes another layer of earth on the bottom of the foot, turns it also to the part where it intends to form the wall of its habitation, and leaves it in the same manner, repeating the process until the cavity is sufficiently large, and thus making the surface even and compact. In forming the dome or arch of the form, a similar method is used, the foot collecting on its under surface a quantity of earth, and the animal, turning it upwards, leaves it by throwing out fresh slime; and this is repeated until the perfect roof is formed.* Having now completed its winter house, the snail draws in its foot, covering it with the mouth, and opens its spiracle to draw in the air; on closing this, it forms with its slime a fine membrane, interposed between the mouth and extraneous substances. Soon afterwards, the mouth secretes a large portion of a very white fluid over its whole surface, which instantly sets uniformly, and forms a kind of solid operculum, like plaster of Paris, about half a line in thickness, which accurately closes the mouth. When this is become hard, the animal separates the mantle from it. After a time, expelling a portion of the air it had inspired, and thus being reduced in bulk, it retreats a little further into the shell, and forms another leaf of mucus,

* Journal of the Royal Institution.

and continues repeating this operation, till there are sometimes five or six of these cells filled with air between it and the operculum. The membranous partitions are more numerous at the end than at the beginning of winter, and in snails inhabiting the mountains, than in those in the plains. Respiration ceases, during the period of hybernation.

HENRIETTA.

But how does the snail get out when the spring arrives?

ESTHER.

Their mode of escape is also singular: the air which they had expired on retiring into their shell further and further, remains between the different partitions of mucous membrane above mentioned, which form so many cells hermetically sealed; this they again inspire, and thus, acquiring fresh vigor, each separate partition, as they proceed, is broken by the pressure of the foot, projected in part through the mantle: when arrived at the operculum they burst it by a strong effort, and finally detaching it, then emerge from their long imprisonment.*

HENRIETTA.

Thank you, Esther, for this interesting account; I hope that some day we shall find a snail in its nest; but this dry weather I never see them.

MRS. F.

No; they remain quiet, because their locomotive powers are much impeded in dry weather, by the dust, &c., adhering to their slimy foot; after rain, they move about with comparative celerity. It is on this principle, that gardeners lay sawdust around the plants which they wish to defend from their attacks, as the sawdust clings so to the foot of the snail as to prevent the animal from passing over it.

HENRIETTA.

What a beautiful thin shell some of the snails have!

* Kirby's Bridgewater Treatise.

MRS. F.

Yes; the history of this genus is very interesting and instructive, affording a striking manifestation of the superintending providence of the Almighty. He cares for the peculiar wants of his creatures; and, though all things are at his command, He is not prodigal of means. He gives what is required, and withholds what is needless. Upon the animals who inhabit the rocky shore, He has bestowed a thick substantial covering; but to snails, the greater number of which live on the land, or in stagnant pools, or peaceful streams, He has given a remarkably light shell, which, while it affords ample protection to its inmate, offers no impediment to its locomotive propensities. Can we see the beautiful adaptation to circumstances, the provision for the wants, and consideration for the comfort of His creatures, and not give the praise and adoration to Him, who, riding upon the wings of the winds, regards not only the sons of men, but the meanest reptile that crawls upon the earth?*

* Mayo, Lessons on Shells.

CHAPTER XIII.

THE UPAS TREE.

FABULOUS ACCOUNT OF THE UPAS. — REAL HISTORY OF THE TWO
POISONS KNOWN UNDER THAT NAME. — BARK DRESSES. — SPATHES
OF PALMS. — ARISTOLOCHIA. — WOURALI AND CURARE POISONS OF
SOUTH AMERICA. — WOLF POISON OF THE CAPE. — FISH POISON OF
IRELAND. — PARYSATIS AND STATIRA. — MITHRIDATES. — CORNELIA.
— MARQUISE DE BRINVILLIERS. — IRON MASK. — MAGNETIC MASK.
— PELISSE.

The air no more was vital now,
But did a mortal poison grow. — SPERAT.

HENRIETTA.

AUNT, would you give us a true account of the Upas tree,
for Esther tells us, that a great part of the stories related
about it are false.

MRS. F.

With pleasure. The reports of the Dutchman Foersch,
who first brought the story to Europe, have been almost all
proved to be incorrect by subsequent travellers; but, suppose,
Henrietta, you first give us the original history of the Upas,
although it is doubtless familiar to you all, and then we shall
the better see how far it is borne out by facts.

HENRIETTA.

It was said that it grew near the Emperor's seat, some
miles from Batavia; that all the country, for twelve miles
round the tree, was perfectly barren, in consequence of the
noxious effluvia which it emitted. The poison was said to

be procured by the malefactors who had been condemned to death, but who were allowed this chance for their lives; and so fatal, indeed, was the effluvia, that scarcely one-tenth returned, of 700 criminals who were sent.

MRS. F.

Yes; Foersch adds, that he had seen several of the criminals who had escaped, and that they told him that the ground was covered with sand and dead bodies, and that no animal whatever was to be seen there. The same author relates that in 1755, 400 families (comprising about 1600 persons), having refused to pay tribute to the Emperor, were banished, but afterwards obtained permission to settle in the country round the Upas. In less than two months their number was reduced to 300, who afterwards obtained the Emperor's pardon. Such is the long received fable of the Upas; let us now proceed to a true account of it.

HENRIETTA.

Thank you, aunt.

MRS. F.

In the first place, I must tell you that there are two plants in the island of Java which produce the Upas poison, with which the natives poison their bamboo arrows, &c.; the one is a considerable tree, the other but a small shrub. Both grow in the eastern part of the island; the tree is called *Upas antiar*; the shrub, *Upas tienté*; the latter affords the more virulent poison of the two; but we will first describe the tree.

ESTHER.

That is, the *Upas antiar*?

MRS. F.

Yes. The *Upas antiar* (*Antiaris toxicaria*), commonly called *Ipo*, is a large tree, about 100 feet high and 18 feet in circumference at the base. It rises with a naked trunk to about 60 or 80 feet, before it throws out its branches. It belongs to the 21st class of Linnæus, and to the natural

family of Urticæ. Its flowers grow in catkins, appearing about the month of June. Its leaves are of a pale green, are covered with rough short hairs, often curled, and dropping off before the time of flowering, and not re-appearing until the fall of the flowers. The wood is white, the bark smooth and whitish; in old trees, the cortex (or outer bark) is more than an inch thick.

HENRIETTA.

I suppose that the tree grows in desert plains?

MRS. F.

On the contrary, it is only met with in the thickest forests. Dr. Horsfield states, that the largest which he saw, was so completely environed by the trees and shrubs of the forest, that it was with difficulty he could approach it. Vines and other shrubs were adhering to the trunk, and ascending to nearly half its height, while birds and lizards perched upon its branches, and ran up and down the tree with impunity. The juice, which in the young branches is white, and in the trunk yellowish, is very viscous, and is bitter to the taste; in consistence it much resembles milk, and flows abundantly if an incision be made in the cortex—so that, in a short time, a cupful may be collected.

HENRIETTA.

Is there any danger in procuring it?

MRS. F.

Yes; to persons of delicate health, whose constitutions render them susceptible of absorbing the effluvia, its exhalations are undoubtedly hurtful, while others feel little or no ill effects from it. The tree may be approached or ascended with safety, unless it be either largely wounded or cut down, when, a considerable portion of the juice being disengaged, it causes cutaneous eruptions and inflammation, as the natives are well aware, they being very unwilling to assist in collecting it. A Javanese whom M. Leschenault sent up for the purpose of gathering some of the flowering branches, was

obliged to cut notches in the trunk, in order to climb up the tree; he had scarcely ascended five and twenty feet before he was obliged to descend; he became very much swollen, and was affected with vertigo, &c.; while another Javanese went up the tree, as far as necessary without feeling any inconvenience. Leschenault himself walked in the midst of the broken branches of a tree which he had had cut down, and even rubbed his face and hands with the juice (washing it off, however, immediately), and he did not feel in the least incommoded by his experiment; so different are its effects upon different individuals.

ESTHER.

Is there not some peculiarity in the bark of the antiar?

MRS. F.

Yes; the liber, or inner bark, is of a fibrous texture, like that of the paper mulberry (*Broussonetia papyrifera*), and, when cleansed from its adhering particles, resembles coarse linen. It has been worked into ropes, which are very strong, and the poorer class of people employ the liber of the younger trees (it being more easily prepared) for the purpose of making a coarse stuff, which they wear when working in the fields; but it requires much bruising, washing, and soaking, before it can be used; and even when it appears to be completely purified, persons wearing this dress, on being exposed to rain, are affected with an intolerable itching, which renders their covering insupportable, a small portion of the gum still adhering to the liber producing, when exposed to the wet, this irritating effect.

ESTHER.

These bark dresses remind me of the beautiful lozenge-shaped meshes of the liber of the Lace-bark tree (*Daphne lagetto*), which has been actually worn as lace. Charles the Second had a cravat made of it, which was presented to him by Sir Thomas Lynch, when governor of Jamaica, of which island (where it is used for ropes) it is a native, as it is also of Hispaniola, where it is known by the name of *bois dentelle*.

MRS. F.

An excellent writing paper is made of another species of *Daphne* (*D. cannabina*), which is a native of Cochin China.

ESTHER.

And then there are the bark dresses of South America, the "*chemises de Marima*," as De Humboldt terms them.

HENRIETTA.

What tree produces them?

ESTHER.

That De Humboldt says he is unable to determine, but he saw trunks of the "arbre a chemises"* more than fifty feet long. The Indians cut them into cylindrical pieces of two feet in diameter. They remove the red fibrous bark, taking great care not to make any longitudinal incisions. The bark furnishes them with a kind of garment, resembling sacks of a coarse stuff. The larger opening serves for the head, and they make two at the sides for arm-holes. In the rainy seasons the natives wear these garments, which have the form of the *poncho*, or South American dress. As in these climates the richness and beneficence of nature are regarded as the first causes of the indolence of the inhabitants, the missionaries do not fail to say, "that in the forests of the Orinoco, garments are found ready made upon the trees." One might add to this story the pointed caps, formed by the spathes of certain palm trees, and which resemble a net-work of coarse stitches.

HENRIETTA.

Like the caps which are made of the Talipot tree.

ESTHER.

Or the flowers of the *Aristolochia*,† which De Humboldt found upon the borders of the Magdalena, four feet in circumference, and which the Indian children amuse themselves with putting upon their heads as caps.

* Humboldt's Voyage, t. viii.

† Tableaux de la Nature.

MRS. F.

Or of those of the tree in question, the Upas antiar; for Sir Stamford Raffles mentions that one of the regents had caps or bennets prepared from the liber, in order to decorate his attendants; they were stiffened with rice water, and handsomely painted; but all refused to wear them, asserting that they would cause the hair to fall off. But to proceed to the poison of the antiar. It is curious, that although this irritating property of the bark is known to the Javanese in all the places where the tree grows, yet the preparation of a poison from the juice, is only known among the inhabitants of the eastern extremity of the island.

ESTHER.

Is this preparation very simple?

MRS. F.

On the contrary, an eye-witness describes it as very elaborate. He saw about eight ounces of the juice, which had been preserved in the joint of a bamboo, strained into a bowl; to this was added about half a drachm each, of a number of vegetable substances,* all finely grated and bruised. The mixture was then stirred, and a seed of capsicum (*C. frutescens*) placed in the middle of the fluid. The seed immediately began to whirl round rapidly for about a minute, when it remained completely at rest. More pepper was then added and another capsicum seed placed as before; a similar commotion took place in the fluid, but in a diminished degree; more pepper was added and another seed, till, on the fourth trial, the seed remained quiet which was considered as a sign that the preparation was complete. The poison is preserved in close vessels, as it will not otherwise keep.

ESTHER.

And is it very virulent upon all animals?

* Viz. Arum, *Kæmferia galanga*, Amomum, onion, garlic, black pepper, &c.

MRS. F.

Fowls have a peculiar capacity to resist its effects, as appears from some experiments which were tried, in which a fowl lived four-and-twenty hours after it had been applied, and some recovered entirely, although a cat had been killed by it in fifteen minutes, and a buffalo in rather more than two hours. Having now fully described the antiar, let us proceed to the other kind of Upas.

HENRIETTA.

The *tiente* —

MRS. F.

Or *Strychnos tiente*,* is a kind of vine, or *liane* as the French term it. Its flowers and fruit are unknown; the stem ascends the highest trees, and grows only in close, shady, and almost inaccessible forests, in a black, fertile, vegetable mould. It is of rare occurrence, and is neither injurious to animal nor vegetable. No juice exudes from its stem, which is reddish, and the young branches are occasionally furnished with tendrils. It is from the bark of the root that the gum is obtained, by boiling, and it is prepared with nearly the same ingredients as the antiar. The root descends two feet under ground, and then extends horizontally for several feet. It is about the thickness of the arm, woody, and covered with a thin bark of a bitter taste; this bark furnishes the poison, which is only to be obtained by boiling—for, when the fresh root is cut, a quantity of water runs from it, without taste, and perfectly harmless. The natives make more mystery about its preparation than about that of the antiar; and its effects, as I have before mentioned, are more violent. As soon as it touches the blood, it is felt immediately, causing excessive burning, fainting, and death.

HENRIETTA.

Then all the rest which is said about the Upas is false?

* Also called Chetik.

MRS. F.

Entirely. You see, from what I have told you, that Foersch's account, as far as relates to the situation of the tree, to its effects upon the surrounding country, and to the application said to be made of the Upas upon criminals, as well as the description of the poisonous substance itself, and its mode of being collected, all prove to be an extravagant forgery; at the same time that its effects must be admitted to be of equal violence with almost that of any vegetable poison known. A poisoned arrow of bamboo, to the end of which is attached a shark's tooth, is thrown by the people of Macassar, Borneo, and the Eastern Islands.* Darts of arrows of antiar poison were employed by the natives of Macassar, in their attack on Amboyna, in about 1650; also, by the people of Celebes, in former wars with the Dutch; but after its having proved mortal to many of their soldiers, the Dutch discovered an infallible remedy in the roots of *Radix toxicaria* (Rumphius). The Upas is also used to mix with rice, as a bait to animals.

HENRIETTA.

But, surely, they cannot eat them afterwards?

MRS. F.

Yes, they can; for the flesh is not poisonous, excepting just the part which comes in contact with the poison.† It is not known to which natural order of plants the Upas tiene belongs, but it is supposed to be one of the Apocinæ, which contains many poisonous plants, such as the bean of St. Ignatius (*Ignatia amara*), nux vomica (*Strychnus nux vomica*), snake wood, &c.

* Rumphius describes the Upas, under the name of *arbor toxicaria*, and thus establishes the identity of the poison tree of Macassar and the other Eastern Islands with the antiar of Java.

† The above account of the two kinds of Upas is taken from Raffles's Java., vol. i.; Dict. des Sciences Naturelles; Leschenault, &c.

*Strychnos Nux vomica.*

ESTHER.

And is not the *wourali* poison of South America produced by a plant of the same family?

MRS. F.

Probably; but nothing decided is known on this point, Mr. Waterton, whose "Wanderings in South America" you may be amused in reading, having been unable to procure specimens of the plant. Nor could De Humboldt find that which produces the *curarè* poison, in flower, so as to enable him to determine its genus; but, from its appearance, he judged it to be a *Strychnos*.

HENRIETTA.

I never heard of this poison.

MRS. F.

It is known to the Otomacos of South America, who poison their thumb nail with it; and so rapid are its effects, that the mere impression of the nail is mortal, when the *curarè* mixes with the blood. It is sold in calabashes, and is of about the consistency of pitch; the best comes from the Esmeralda, and is sold for about two shillings an ounce.*

ESTHER.

Is it the same as the *wourali*?

* Humboldt.

MRS. F.

No; there are many poisons used by the different South American tribes, such as the wourara or wourali of Dutch Guyana, the curarè of the Oronoco, and the ticuna of the Amazons, all varying in their kinds. Muriate of soda (common salt) is the principal antidote employed, but no proofs exist of its efficacy.

ESTHER.

Dr. Wallich mentions a frightful poison extracted from a species of aconite (*Aconitum ferox*) called among the natives Visha Bish; which he states to be as universally used, and to be as deleterious, as the Upas.

HENRIETTA.

Then which are supposed to be the most violent vegetable poisons known?

MRS. F.

Upas tienté, the poison of the ticuna, and the wourali;* but many, and indeed most of these, naturalists have, as yet, had little opportunity of examining. That in use at the Cape, for instance, where the Hottentots poison their arrows with a species of Euphorbia, and also with a large bulbous lily (*Amaryllis disticha*), which grows plentifully about the Cape. The natives take the bulbs, when the leaves begin to shoot, cut them across, and leave them in the sun until they acquire the consistency of gum, and are fit for use.

ESTHER.

For what purpose are these poisons employed?

MRS. F.

For killing antelopes and other small animals. The natives also throw large pieces into the pools of water resorted to by the wild beasts; the animals drink and die immediately. At the Cape, there is also another poison which is much used by

* Humboldt, Voyage, t. viii.

the European inhabitants; it is called the wolf poison, and is probably a species of *Rhus*. The nuts are roasted like coffee, pounded, and stuffed into small pieces of meat; these are thrown into the fields, where they are soon found by the voracious hyænas which are generally killed by this expedient.*

ESTHER.

Your speaking of poisonous *Euphorbiæ* reminds me of the use made in Ireland of a British species (*Euphorbia hiberna*). It is used extensively by the peasantry in the county of Kerry for poisoning or rather stupefying fish, in the same manner as the exotic species (*Euphorbia piscatoria*) is employed for the same purpose by the negroes, who pound the leaves between two stones, and mix them with cassada paste. So powerful are the qualities of the Irish *Euphorbia*, that a small creel or basket filled with the bruised plant is sufficient to poison the fish for several miles down a river.

ESTHER.

I have heard that the art of slow poisoning is carried to a great height by the African negroes in the West Indies.

MRS. F.

It is, I believe, to an extent of which we can form little conception, and which offers but few parallels in civilised life.

FREDERICK.

That was an ingenious contrivance of Parysatis, the wicked queen of Darius Nothus, to get rid of her rival and daughter-in-law Statira.† She poisoned one side of the knife with which she helped Statira to some bird, which she cut in two parts, gave one half to Statira, who soon after died of convulsions, while the wicked Parysatis ate the other half herself without injury.‡

* Pattison's Journey to the Cape.

† Wife of Artaxerxes Mnemon, who was King of Persia B. C. 404.

‡ Rollin, book iv. c. 2.

MRS. F.

The ancients must have been well acquainted with the art of compounding subtle poisons, for we find, for instance, that Mithridates, and other celebrated persons, used to carry poisons in their rings; and there is also the story of Cornelia, which, though doubtless much exaggerated, must probably have been founded on fact.

FREDERICK.

Which Cornelia, aunt?

MRS. F.

Of course, I do not mean the mother of the Gracchi, but a Roman lady of that illustrious family, and of the same name, who, with many others, was accused (during the time of an epidemic at Rome) of preparing poisons from which numbers died. When brought before the assembly of the people, the culprits attested that they had only administered salutary remedies; but the slave who had informed against them, demanded that they should swallow their own potions. His advice was adopted; they drank the poison, and all expired, having thus probably, escaped a more severe and ignominious punishment at the hands of an enraged populace.*

ESTHER.

Then there was also another instance at Rome, in the wicked Tofania.

MRS. F.

But none have surpassed in wickedness the infamous Marquise de Brinvilliers and her associates.

ESTHER.

That is the person whom Madame de Sevigné mentions in her letters.

MRS. F.

It is,

* B. C. 331, Biographie Universelle.

HENRIETTA.

Will you have the kindness to tell us about her?

MRS. F.

This wretched woman was rich and beautiful, and the wife of the Marquis de Brinvilliers, but was anxious to marry Sainte Croix, a captain in the army, and sought only to get rid of her husband, in order to accomplish her wicked purpose. Her father caused Sainte Croix to be shut up in the Bastille, where he became acquainted with an Italian of the name of Exill, who made a trade of poisons, and who was one of those who were concerned in the death of more than a hundred and fifty people at Rome, during the pontificate of Innocent the Tenth. From him he learned the secret of his horrid art, and communicated them to the Marquise de Brinvilliers, who was as anxious as Sainte Croix to revenge herself upon her family. Deaf to every human feeling, this wretched woman first tried the poisons by mixing them with biscuits, which she distributed to the poor: she then poisoned her father and her two brothers, and endeavored to destroy her husband; but Saint Croix, disgusted at crimes so revolting, did not wish to marry a woman as wicked as himself, and as often as she gave a poison to her husband, Sainte Croix administered an antidote, so that he survived all the atrocious attempts of the Marquise. At last her practices were discovered. Her accomplice, Sainte Croix, died suddenly, from the following accident. The poisons which he prepared were of so subtle a nature, that the mere inhaling of them was fatal; Sainte Croix, therefore, always worked with a glass mask, in order to intercept the noxious exhalations; but one day the mask accidentally fell from his face, and he was immediately suffocated.

HENRIETTA.

Sainte Croix's mask reminds me of the Iron Mask.

MRS. F.

We will talk about that when I have finished my account

of Brinvilliers. On examining the effects of Sainte Croix, a box was found addressed to Madame de Brinvilliers, but which was opened, and found to contain a collection of poisons. The whole tissue of their crimes was discovered; the Marquise was tried and condemned to be beheaded, her body burned, and her ashes scattered in the wind. This sentence was executed in 1676; but these poisonings continuing in Paris, even after her death, the *Chambre ardente* was established in 1699, to inquire into the matter. Many were accused, but the most notorious of the culprits was a woman of the name of Voisin. She was punished with death; but the public mind continued for a long time to be disturbed with ideas of poison, and many natural deaths were doubtless attributed to violence and poison.* Now I have finished this frightful history of crime, let us hear, Henrietta, what you have to tell us about the Iron Mask.

HENRIETTA.

I do not think, aunt, that I know much about it, except that a person so called was confined in the Bastille by Louis XIV, and that he always wore an iron mask, and no one ever could find out who he was.

MRS. F.

That is pretty nearly all that is known about this singular individual, who has given rise to various conjectures respecting him, some imagining him to be of royal birth, others merely supposing him to have been a state prisoner. Who he was will probably ever remain a mystery, but he will always excite the greatest interest, and a curiosity perhaps the more lively, from the little probability there exists of its ever being satisfied. We will read more about him this evening; but in the meantime, I must set you right upon the common error respecting the mask which he wore. It was made not of iron, but of velvet, and the chin part was furnished with steel

* See Mme. de Sevigne, *Causes celebres*, *Biographie Universelle*. The account of the first must be received with caution, and due allowances made for the excitement of the time.

springs, to enable him to eat without raising it; but people supposing the mask to be made entirely of iron, gave its unfortunate wearer the appellation of the Iron Mask, by which he is commonly designated.*

ESTHER.

Now that we are on the subject of masks, let me read you an account of the magnetic mask which I met with yesterday.†

“In needle manufactories, the workmen who point the needles are constantly exposed to excessively minute particles of steel, which fly from the grindstones, and mix, though imperceptible to the eye, as the finest dust in the air, and are inhaled with their breath. The effect, though imperceptible on a short exposure, yet, being constantly repeated from day to day, produces a constitutional irritation, dependent on the tonic properties of steel, which is sure to terminate in pulmonary consumption; insomuch, that persons employed in this kind of work used scarcely ever to attain the age of forty years. In vain was it attempted to purify the air before its entry into the lungs by gauzes or linen guards; the dust was too fine and penetrating to be obstructed by such coarse expedients, till some ingenious person bethought him of that wonderful power which every child who searches for its mother’s needle with a magnet, or admires the motions and arrangements of a few steel filings on a sheet of paper held above it, sees in exercise. Masks of magnetised steel wire are now constructed and adapted to the faces of the workmen. By these the air is not merely *strained* but *searched* in its passage through them, and each obnoxious atom arrested and removed.”

MRS. F.

A happy instance of how a knowledge of the laws of nature enables us to improve our condition, and to remedy

* Biographie Universelle, Siecle de Louis XIV, &c. Mr. Ellis has also written the “History of the Iron Mask.”

† Herschel’s Discourse.

evils the most serious and distressing. But we must now take a walk, for it is getting late; and indeed it looks so much like rain, that I shall put on my pelisse. By the by, who can tell why a pelisse is so called?

ESTHER.

I do not know, mamma.

MRS. F.

From *pelles*, skin; hence *pellice*, *pelisse*; they having originally been always made of, or lined with, fur.

CHAPTER XIV.

NATIONAL EMBLEMS.

BADGES OF THE SCOTCH CLANS.—SHAMROCK.—IRISH HARP.—ROYAL SUPPORTERS.—HERALDIC VISITATIONS.—DISTINCTION BETWEEN NOBILITY AND GENTRY.—COMMONER.—HORSE, SAXON, KENTISH, HANOVERIAN, CARTHAGINIAN, AND AGRIGENTINE.—HORSE AMONG THE ANCIENT GERMANS.—RAVEN.—SAGITTARIUS.—PLANTAGENETS.—FLEUR DE LYS.—LILY AND THE ROSE.—PAPAL PRESENT.—“UNDER THE ROSE.”—ROSE OF ENGLAND.—HAWTHORN.—SALAMANDER, NATURAL HISTORY OF.

Hail to the chief who in triumph advances!
 Honored and blessed be the ever-green Pine!
 Long may the Tree in his banner that glances,
 Flourish, the shelter and grace of our line!”

SCOTT.

HENRIETTA.

AUNT, will you have the kindness to tell me what *gale* is, which Mr. Campbell said yesterday was the badge of his clan?

MRS. F.

The sweet gale, or bog myrtle (*Myrica gale*), is a shrub which grows abundantly in bogs and marshes, and the leaves and berries, which are covered with resinous dots, exhale a delightful fragrance when rubbed between the fingers. The gale is abundant in Scotland, where it is the favorite retreat of the black game. Linnæus says that the berries boiled in water, yield wax like those of the candleberry myrtle (*Myrica cerifera*). But if you would like to know some of the em-

blems of the different Scotch clans, here is a list I once made of all which I was able to collect:

- Buchanan — birch (*beatha*, Gaelic).
 Campbell — gale, or bog myrtle (*Myrica gale*).
 Cameron — oak (*darach*, Gaelic).
 Colquhoun — hazel.
 Cumming — willow, *salix* (*seileach*, Gaelic).
 Drummond — holly (*creil thionn*, Gaelic).
 Forbes — broom (*Cytisus scoparius*).
 Ferguson — poplar.
 Gunn — rose-root (*Rhodiola rosea*).
 Grant — cranberry (*Vaccinium oxycoccus*).
 Macalister — fine-leaved heath (*Erica cinerea*).
 Macdonald — cross-leaved heath (*Erica tetralix*).
 Macdonell — ling (*Calluna vulgaris*).
 Macrae — savin-leaved clubmoss (*Lycopodium alpinum*).
 Macfarlane — cloudberry (*Rubus chamæmorus*).
 Macgregor — pine.
 MacIachlan — mountain ash (*Pyrus aucuparia*).
 Maclean — crowberry (*Empetrum nigrum*).
 Macleod — red whortleberry (*Vaccinium vitisidæa*).
 Macnab — bramble (*Rubus*).
 Murray — juniper.
 Ogilvie — hawthorn (*Cratægus oxyacantha*).
 Oliphant — maple.
 Robertson — brake, or bracken (*Pteris aquilina*).
 Ross — arbutus.
 Sinclair — trefoil (*Trifolium*).

ESTHER.

Thank you, mamma. I should like to copy this list, and will try to add the badges of the other clans which you do not enumerate, as perhaps I may get some of our Scotch acquaintances to tell them to me.

HENRIETTA.

Is the trefoil, aunt, which you mention as the emblem of the Sinclairs, the same as the Irish shamrock?

MRS. F.

What the true shamrock is, has given rise to many learned disputations; some writers identifying it with *Medicago maculata*, others with the wood sorrel (*Oxalis acetosella*), with whose elegant little spring flower you are all well acquainted. The advocates for the pretensions of this plant, assert that the clover (*Trifolium repens*) is not a common wild plant in Ireland; but I do not, I confess, trouble myself with this controversy,* being content to receive, as the real shamrock, that which is worn as such by the Irish on St. Patrick's day.

HENRIETTA.

Pray, aunt, when was the Irish harp introduced into the arms of the king of England?

MRS. F.

It was James the First who added it to the royal achievement; and it was also this king who first had the unicorn as one of the supporters of the Royal Arms.

HENRIETTA.

But were not the lion and the unicorn always the royal supporters?

MRS. F.

No, they varied much with the different sovereigns — Edward III had a lion and an eagle; Henry IV, a white antelope and a white swan; Henry V and Henry VI, an antelope and a lion; Edward IV, a black bull and a lion; Edward V, a yellow lion and a white lion.

HENRIETTA.

Aunt, I know that Richard III had a boar, because Shakspeare calls him "the boar," and sometimes, in derision, the "hog."

MRS. F.

Yes; a white boar was the crest of the York family, and

* See Journal of Royal Institution.

was borne by Richard, with a yellow lion. Henry VII had a lion and a red dragon; Henry VIII, Mary, and Elizabeth, all bore a lion and greyhound; but when James I came to the throne, he added the unicorn, which was the arms of Scotland, and this, with the lion, have, since his reign, always been the supporters of the British Arms.

ESTHER.

Who is it, mamma, that are entitled to bear supporters to their arms? I thought it had been only peers, but I see that there are many others who do so.

MRS. F.

Supporters are used by all peers, and are also borne by their eldest sons (if above the degree of baron), but the younger sons are not allowed to use them. The practice of the kings of England granting supporters to the peers of each degree, began in the reign of Henry VIII, as did that of giving them to the Knights of the Garter and of the Bath. The Nova Scotia baronets are, by their patents of creation, allowed to carry them, although the same privilege was not extended to the English baronets, at the time of the institution of the dignity, it being only by virtue of a royal licence that any of the baronets bear them. Another curious anomaly with regard to supporters is, that the kings of arms in England are not authorised, without a royal warrant, to grant supporters to any one below the dignity of Knight of the Bath, and yet Lyon King of Arms, in Scotland, may, by virtue of his office, grant them without the royal warrant, and has, indeed, on some occasions, exercised his privilege.*

ESTHER.

I have read that the custom of having supporters to arms originated in the ancient practice at tilts and tournaments, of knights causing their shields to be carried by servants or pages, under the disguise of lions, griffons, Moors, &c., who also held and guarded the escutcheons which the knights

* Clarke's Heraldry.

were obliged to expose to public view some time before the lists were opened. Pray, mamma, do heralds now go round to register the arms of the different families, as they used formerly to do?

MRS. F.

No; that custom has been abandoned; the earliest visitation was in 1529, the latest in 1686.

HENRIETTA.

What was their object?

MRS. F.

These visitations were conducted every thirty years by Norroy in the north, and by Clarenceux in the south of England. On these occasions each of these kings at arms, attended by their suite, summoned the neighboring gentry to their county town, to have enregistered the births, deaths, and marriages that had occurred in their families since their last visitation. Such persons as had usurped titles or dignities, or had borne ensigns of gentility which did not belong to them, were obliged, under their own hands, to disclaim all pretence or title to them, and, for their presumption, they were moreover degraded by proclamation made by the common town crier, in the market place nearest to their abode; and, under the names of these plebeians who had assumed coats of arms, was written "*ignobiles*."*

ESTHER.

What confusion, what stripping of borrowed plumes would such a visitation cause now, when so many assume arms to which they have no title, and all style themselves "*gentlemen*."

MRS. F.

Yes; it is quite absurd to see how indiscriminately the title is applied; but I believe that this abuse of it is mostly confined to England. In France they are not so ridiculous; on

* Lawrence on the Nobility of the English Gentry.

the contrary, when the king holds a court, it is thus announced: "Demain matin, le Roi recevra les *hommes* et les *femmes*;" and when he addresses the united Chambers of Peers and Deputies, he styles them "Messieurs." In short, there is no degradation to persons of quality to be called *men* and *women*; but, by following up a different system, and calling a mixed society "*gentlefolks*," we have destroyed the true meaning of the word in England.*

FREDERICK.

Then what is, after all, the true meaning of the term "gentleman?"

MRS. F.

That is, perhaps, rather a difficult question to answer, but I will endeavor to explain it as well as I am able. According to an old writer,† "Gentlemen be those whom their blood and race doth make noble or known." "The Commonwealth of England is governed by three sorts of persons: the sovereign; the *Gentlemen* (which are divided into two parts — the Barony or estate of Lords, and those which be no Lords, as knights, esquires, and simple gentlemen); the third and last sort of persons are named Yeomen."

ESTHER.

Then this division identifies noblemen and gentlemen in the same class.

MRS. F.

Yes. Nobility means notability; noble is, worthy of notice or being known. Any individual who distinguishes himself may be said to ennoble himself. A prince judging him worthy of notice, may give him letters of nobility. *Nobility*, therefore, may be acquired — *gentility* must be innate. *Noblemen* may be only persons of rank and distinction, but *gentlemen* must be persons of family and quality, inasmuch

* Lawrence on the Nobility of the English Gentry.

† Sir T. Smith, who died in 1577.

as it comprises birth as well as notability. Gentility, therefore, is obviously superior to nobility.

ESTHER.

Yes; I well recollect the answer of James I, who when asked by his nurse to make her son a gentleman, replied, "My good woman, a gentleman I could never make him, though I could make him a lord;" thus marking the distinction you have just drawn between the two appellations.

MRS. F.

I have been the more particular in enforcing this distinction upon your attention, because it is among the gentry, not among the peers, that we must seek the true nobility of England. There are, perhaps, not above four to five hundred peers in Great Britain, but there are upwards of thirteen thousand of ancient nobility. The landed proprietors are, in every country, the natural nobility; hence, in the opinion of the genealogist, those families whose names are the same as their estates, such as Ratcliffe of Ratcliffe, Wolseley of Wolseley, &c., are the noblest families in their respective provinces. Could any title add to the nobility of the Wynns, or to that of the Hampden, upon whose tomb is inscribed "John Hampden, 24th hereditary Lord of Great Hampden?" Hence some of the old writers very properly speak of the nobility *named* and *unnamed*, that is, titled and untitled.

ESTHER.

One question more, if you please, mamma; what is the meaning of the term "commoner?"

MRS. F.

In a legal sense, all are commoners who are amenable or subject to *common* tribunals; the peers, therefore, are not commoners, because they are their own judges, this being an exclusive privilege, but no proof of nobility; for many persons who have precedence over peers are subject to the common law.

HENRIETTA.

Will you give us some examples, aunt?

MRS. F.

Not only the sons of dukes and marquises, but even the princes of the blood, and sons of the king, if accused before they are made peers, must be tried by common juries. So also would prince Leopold (the present king of Belgium), who, having no peerage, ranks as the first commoner, and is amenable to common courts accordingly.* But now that I hope I have made these distinctions sufficiently clear to you, suppose we return to our original subject, the arms, or rather emblems which have been adopted, at different times, by the various rulers of England. To begin then by the Saxons, what was theirs?

HENRIETTA.

A horse; and it is still the arms of the county of Kent, for we see the horse rampant, on all the pockets of Kentish hops.

ESTHER.

And it has also re-appeared in the English arms, in the running Hanoverian horse, which was added to the royal achievement, in an escutcheon of pretence, on the accession of George I.

MRS. F.

But gently; I have much more to say about the horse, before we descend to such modern times.

FREDERICK.

The Carthaginians had a horse upon their coins, and the Agrigentines used to pay funeral honors to those horses which were victorious in the Olympic games; and indeed writer assert that they erected monuments to their memory.

* Lawrence.

MRS. F.

Well remembered, Frederick; but it was among the Germans that the horse was a particular favorite. Being essentially a warlike people, devoted to the chase, and indifferent to agricultural pursuits, it formed an important part of their property. Superstition also had a great part in the value which the Germans attached to their horses. They used to sacrifice them, and they also employed them to predict the future. Those which were consecrated to this latter use were quite white, had never been used for labor, and were fed in the sacred woods which served them as temples. On stated occasions they were harnessed to a car appropriated to that purpose, and also considered as sacred. The king, the prince, or the priest of the people accompanied them and predicted the future by their neighings.

FREDERICK.

It was by the neighing of his horse that Darius (father of Xerxes) gained the throne of Persia.

MRS. F.

True; but to return to the Germans: their laws prove the value that they set upon their horses; the fine for stealing one being forty-five pence, while it was only thirty-five for stealing a slave. A man, after he was unable to carry arms and ride on horseback, was considered to be no longer fit to live, and was incapacitated from disposing of his property. The gigantic horse cut out of the chalk bank, which still exists in the south-west of the hill, near Edrington, in Berkshire, and which occupies an acre of ground, and may be seen in some points at a distance of twelve miles, is supposed to have been cut at some later period in commemoration of the victory gained there by Alfred over the Danes.*

ESTHER.

Did not the chiefs often take the name of a horse? Horsa for instance?

* Wheatman's History of the Northmen.

MRS. F.

Yes; and Hengist also, both names signifying a horse in the Anglo-Saxon language. Indeed all the names ending in *mar* or *mer*, such as Waldemar, Hincmar, &c., appear to be derived from some names of horses.

ESTHER.

The Germans used to eat horse flesh.

MRS. F.

Yes, and esteemed it one of their favorite dishes. St. Boniface* addressed Pope Gregory III, to know what course he should pursue, and the Pope desired him to prohibit it; but it was not easy to make the Germans listen to this prohibition, and it required fresh injunctions from the succeeding Pope to induce them to discontinue this repast, it being accompanied by a similar prohibition with respect to hares, beavers, storks, and crows, which were all eaten by the Germans.† But we are digressing very far from our subject; now, who will tell us the Danish standard?

MARY.

The Raven.

ESTHER.

Yes; during the reign of Alfred, when the Saxons defeated the Danish fleet, which, under Hubba, had blockaded them in the castle of Kynwith, in Devonshire, and Hubba himself was slain, they obtained, in addition to an immense booty, the famous magical standard of the *Reafen*, the loss of which

* St. Boniface (better known as St. Winifred), a native of Devonshire, and the apostle of the Germans. In 716 he gained permission of the Pope to preach the gospel in Germany, of which country he was made primate, and he afterwards converted Pepin. To him, the Germans are under the greatest obligations. He preached Christianity among them, procured them teachers in religion and in science, abolished the use of horse flesh, and did not shrink from laying down his life in the cause, being massacred in 755.

† Schmidt, *Histoire des Allemands*, Vol. i.

was a fatal presage to the Danes. This banner, adorned with the figure of a raven, is said to have been woven by Hubba's sisters in one noontide. It was believed that the bird appeared as if flying when the Danes were to conquer, but was motionless when they were threatened with defeat.*

MRS. F.

The raven is, I know not why, considered as the emblem of constancy, and is, among the Swedes, as sacred a bird as the stork among the Dutch.

ESTHER.

Or the crane among the Calmucs; for I was reading in the travels of some Russian missionaries, that, when their servant shot a crane, the greatest horror was expressed by the bystanders, who quoted an old proverbial saying among the Calmucs, that "the man who killed a crane would be punished by fate." They prophesied great misfortunes for the deed upon the servant, who was at last so intimidated by their denunciations, that it was some time before his master could calm his apprehensions.

MRS. F.

Thank you, Esther; but now let us endeavor to proceed with our emblems. That of Stephen comes next, which was a Sagittarius, because he entered England when the sun was in that sign of the zodiac.

Then it must have been in the month of November.

MRS. F.

Yes; and another reason assigned for his adopting it is that he obtained a great victory chiefly by help of his archers. Stephen, therefore, took this sign for his arms, and discontinued bearing his paternal arms.

ESTHER.

We now come to the Plantagenets.

* Wheatman's History of the Northmen.

MRS. F.

Who bore the *Genista* or broom as their device. It was first adopted by the grandfather of Henry II, Fulk, Count of Anjou, who bore the broom branch in his pilgrimage to the Holy Land. From this circumstance the name of Plantagenet (*Planta-genista*, or *genet* in French,) descending to our kings.

HENRIETTA.

But what made him fix upon the broom?

MRS. F.

Because it was the fittest emblem of humility; the brick and marble floors, which were then strewed with rushes or odoriferous herbs, being, in the season, covered with the fragrant flowers of the broom. When Louis IX married Margaret of Anjou, he instituted an order of knighthood; but in token of his humility, he adopted the broom flower, which, with the *fleur de lys*, was enamelled alternately on the collar. The motto was "Humiles exaltat."

FREDERICK.

That is, "He exalts the humble."

MRS. F.

Edward III, as you all know, was the first to assume the *fleurs de lys* in the royal escutcheon. He bore them (what the heralds term) *semée*, that is, irregularly strewed over the field, without any regard to number. It was Charles VI, of France, that first reduced their number to three.

ESTHER.

The *fleur de lys* is a very ancient symbol. In the temple of Dendera, among the hieroglyphics, is frequently to be seen a sceptre, surmounted by a *fleur de lys*, resembling ex-

actly that of the kings of France.* In several eastern countries it was the emblem of power; the kings of Syria and Babylon bore it at the end of their sceptre: and Montfaucon mentions a manuscript of the tenth century, in which is engraved a figure of David, with a sceptre surmounted by a *fleur de lys*.

HENRIETTA.

But the *fleur de lys* is not like a lily.

MRS. F.

Many and various are the hypothèses concerning the origin of this emblem: some say it is the head of a French battle axe; others, the iron of a French javelin or spear head; while those who advocate its floral origin consider it to be the representation of the common Iris, or Flower de Luce, which when two of the petals are viewed in profile, and the third fully expanded, offers a fancied resemblance to the *fleur de lys*. Louis VII, when engaged in the second crusade, took this figure for his arms; and as the common people generally contracted *Louis* into *Luce*, it is natural to imagine that this flower was, by corruption, distinguished, in time, by the name of the Flower de Luce, or Louis. When Louis VII caused his son Philip Augustus to be inaugurated at Rheims, he had all his clothes embroidered with the *fleur de lys*.†

ESTHER.

The lily and the rose have, from high antiquity, been usual as emblems of the Church,‡ and generally accompany, either separately or together, the paintings of the Virgin Mary.

* Sonnini's Travels.

† La Pluche, Spectacle de la Nature.

‡ "I am the rose of Sharon and the lily of the valley," &c.

MRS. F.

A rose was the seal of Luther, and a golden rose was often the present of the popes to a favoured sovereign.

ESTHER.

Yes; I recollect reading that one was sent by Alexander III, to William King of Scotland; another by Alexander VI, to Henry VIII.*

MRS. F.

And another by Innocent X, in 1651, to Louisa of Gonzaga, the queen of John Casimir, King of Poland, at the same time that he presented the king with a consecrated sword and banner.† The rose was considered as an emblem of the mortality of the body, the gold of which it was made, of the immortality of the soul.

FREDERICK.

The rose was dedicated to Aurora, as an emblem of youth.

MRS. F.

And to Cupid, because of its fugacity, as Tasso expresses it:

"Così trapassa al trapassar d'un giorno
Della vita mortale, it fior e 'l verde."

G. L. c. xvi. 13.

But did you ever hear the origin of the term "under the rose" as an indication of secrecy? It is an expression you may probably never have heard, but I allude to it on account of the custom which gave rise to it. Cupid is said to have given a rose as a bribe to Harpocrates, God of Silence; from this originated a practice which prevailed among the

* Clark's Travels in the Holy Land.

† Salvandy, Histoire de Pologne, vol. i.

northern nations, of suspending a rose from the ceiling over the upper end of their tables, when it was intended that the conversation which took place should be sacred to secrecy. It is this custom, undoubtedly, which first gave rise to the common expression "under the rose."*

FREDERICK.

The white rose sprang from the tears of Venus; the red from a wound she received from a thorn in her foot when running about the woods in search of Adonis. But you have not yet alluded to it, aunt, in the wars of the houses of York and Lancaster.

MRS. F.

They were first assumed by John of Gaunt and his brother Edward Duke of York, from whom the two rival houses descended, and who therefore took them as their distinctive badges, until the termination of the civil war by the marriage of Elizabeth of York with Henry VII; when the two roses united in one became the royal badge of England. The rose or rosette to the shoe was worn under the house of Tudor, but declined under the Stuarts, when the fashion of shoe-strings arose. I think there is now only one English emblem which we have not mentioned, and that is, the hawthorn.

HENRIETTA.

When was that used?

MRS. F.

We have mention made of it at the meeting of the Field of the Cloth of Gold. It had been a popular emblem among the English since the battle of Bosworth Field, from the circumstance of the crown of Richard having been found on that day lying under a hawthorn bush, whence it was taken to

* Medical Botany.

place it upon the head of Henry VII. Who can tell me what was the device of Francis I, at that famous meeting with Henry VIII?

ESTHER.

I do not know, mamma.

MRS. F.

It was the salamander, with the motto "I cherish the good and extinguish the bad."

FREDERICK.

But, aunt, it is not true that salamanders can live in the fire?

MRS. F.

No; but the idea is not so destitute of foundation as we commonly suppose. Bosc, a French naturalist, says, that salamanders emit from their skin a lubricating, white fluid, when they are annoyed; and, if put into the fire, it sometimes happens that this fluid extinguishes it sufficiently to permit the animal to escape. When touched, the skin of the terrestrial salamander will transude the white fluid, which is extremely acrid, and produces a very painful sensation upon the tongue. It sometimes throws it out to the distance of several inches; the scent of this fluid is very disagreeable, and will poison small animals, although it does not appear to affect large ones. Mr. Kirby relates the following anecdote in support of the above account:—Some ladies at Newbury had a very damp cellar which was frequented by frogs, and a kind of newt or salamander of a dull black color. Several frogs were put into a pail, and while the ladies were looking one frog after another turned itself on its back, its legs stiffened and it died. One of these efts they found running quickly amongst the frogs, each of which, when touched, died instantly, the animals evincing the greatest horror at their enemies. — A few nights afterwards, one of these efts was found in the kitchen, and the cook took it up with the tongs and threw it

into a good fire. The reptile slipped, like lightning, through the coals, and ran away apparently unhurt. Thus we see there is some degree of truth in the fable of the salamander, and, indeed, we shall find, that most of the imaginary accounts of the ancients rest upon some foundation, however slight it may be.

CHAPTER XV.

THE GIPSIES.

GIPSIES. — HINDOO ORIGIN. — MAJOR KEPPEL'S ACCOUNT OF THEM. — ROGERS'S DESCRIPTION. — SORTES VIRGILIANÆ, HOMERICÆ AND SANCTORUM. — ROMAN NUMBER SIX. — NINE OF DIAMONDS. — YEAR 88. — COUNTESS OF ALBANY. — LAST OF THE STUARTS. — TOMB IN ST. PETER'S. — THE LADY ARABELLA. — QUEEN ELIZABETH. — HER VANITY AND LOVE OF DRESS. — ANECDOTES OF HER COURT. — LEARNED LADIES. — ANNE OR CLEVES. — ANGLO-SAXON NEEDLEWORK. — SPINSTERS. — HYPATIA. — VITTORIA COLONNA. — HELEN CORNARO PISCOPIA. — NOVELLA D'ANDREA. — CLOTILDA TAMBRONI. — LAURA BASSI. — AGNESI. — ENGLISH FEMALE SCIENCE.

"I see a column of slow-rising smoke
 O'ertop the lofty wood that skirts the wild.
 A vagabond and useless tribe there eat
 Their miserable meal. A kettle, slung
 Between two poles upon a stick tranverse,
 Receives the morsel — * * * * *

* * * Hard-faring race!

They pick their fuel out of every hedge,
 Which, kindled with dry leaves, just saves unquench'd
 The spark of life. The sportive wind blows wide,
 Their flutt'ring rags, and shows a tawny skin,
 The vellum of the pedigree they claim.
 Great skill have they in palmistry, and more
 To conjure clean away the gold they touch,
 Conveying worthless dross into its place;
 Loud, when they beg, dumb only when they steal."

COWPER'S TASK.

MARY.

MAMMA, there's a gipsy at the door; may I have my fortune told?

MRS. F.

Indeed, Mary, I cannot consent to anything so foolish and so wrong. So, take off your bonnet, and I will give you some account of this idle race.

MARY.

Where do they come from?

HENRIETTA.

From Egypt, to be sure.

MRS. F.

Gently, Henrietta; do not decide with such confidence upon a subject on which the learned are so much in doubt. Besides, even if you *had* been correct, a little more modesty had been more becoming. I am always pleased when you are able to give a ready answer to my inquiries; but believe me, that knowledge is of little good unless it lead to that true wisdom which teaches us to think humbly of ourselves. The truly wise, are always the most humble, because, the more they learn, the more sensible they are of how little they know. Sir Isaac Newton's opinion of his own splendid results you all know,* and Solon, one of the wisest of heathen philosophers, declared, that all he had learned from his knowledge was, "that he knew nothing." But, to return to the gipsies:—Grellman, a German author, who had entered into a minute investigation of the subject, supposes them to be of Hindoo origin, probably of the lowest castes, a conjecture which he founds upon the similarity of language between the Egyptians and the Hindoos.

MARY.

Do not these gipsies speak English?

* "I know not," said he, "what the world will think of my labors, but, to myself, it seems that I have been but as a child playing on the sea-shore, now finding some pebble rather more polished, and now some shell rather more agreeably variegated than another, while the immense *ocean of truth* extended itself *unexplored* before me."

MRS. F.

Not among themselves; they then converse in a jargon or language unintelligible to others. There appears to be a striking coincidence in the grammatical construction of the Hindoo and gipsy language; many of their manners and customs closely resemble each other, and Grellman collected four hundred words from the gipsies, all of which were nearly synonymous with the Hindoo.

HENRIETTA.

But how did they come into Europe?

MRS. F.

Grellman supposes that, in the war of devastation carried on in the years 1408 and 1409 by Timur Beg —

HENRIETTA.

I beg pardon for interrupting you, but is he the same as Tamerlane?

MRS. F.

Yes, he is. His wars are supposed to have driven the gipsies through the Persian district, along the Persian Gulf, through Arabia Petræa, across the Isthmus of Suez into Egypt. Mary, I am particular in giving you their exact route, that you may trace it on the map.

MARY.

Thank you, mamma.

MRS. F.

Entering Europe, as they did, by Egypt, they acquired the name of Egyptians, corrupted into *Gipsies* in English, *Gitano* in Spanish, *Zigeuner* in German, *Cingani* in the Hungarian, and *Zingari* in the Italian languages. In Germany they were first observed in 1414. Muratori quotes a writer who says, that in 1422, two hundred *Cingari* appeared in the town where he lived, and stated that they came from India; and Munster, in 1524, gathered from a gipsy, accounts which

proved his impression of their having come originally from India.

ESTHER.

But do not some people suppose them to be really Egyptians?

MRS. F.

Yes; and those who advocate their Egyptian origin, assert, that when Selim conquered Egypt in 1517, several of the nations refused to submit to the Turkish yoke, and revolted, under one *Zinganeus*, whence the Turks called them *Zinganees*, but that being at length surrounded and banished, they dispersed all over the world.

MARY.

Were they always fortune-tellers?

MRS. F.

Yes, from the very first they derived their subsistence from practising the black art, palmistry, begging, and stealing. Nevertheless, whatever may have been their origin, it is certain that they appeared in great numbers, and, as it were, simultaneously, in almost every country in Europe, in the fifteenth century. In 1560 they were expelled from France; in 1591, from Spain; and from England at an early period; for in 1500, there is a statute of Henry VII against them. The manner in which they have spread is incredible; Europe cannot contain less than 700,000.

ESTHER.

But where do they chiefly reside?

MRS. F.

The southeastern countries, Hungary and Transylvania, are their principal abodes, where, in summer, they reside in tents; in winter, in holes ten or twelve feet deep in the earth. They possess a sort of regular government, and are ruled by a leader or chief. In Turkey, also, they are every where to

be found. Mary, give me Major Keppel's Travels across the Balkan, and I will read the passage in which he describes them: "On the left hand side of the road, we saw twenty black tents pitched in a straight line, with two flags, one white and the other red, fixed at the right flank. These formed an encampment of gipsies, which had stationed itself there to welcome, with a band of music, a bride who was to pass in that direction on her way to her future husband. * *

* The tents of the wanderers closely resemble those of the Illyants, which I had seen in the Arabian desert. Gipsies are to be seen in every part of Turkey; I constantly fell in with them in the course of my journey. The largest encampment that I ever saw was at Shumla, where they were assembled to the number of some thousands. The appearance of their women is always most striking in a Mahometan country, where such rigid notions are entertained of female decorum. Nothing can be more strongly contrasted than the uncovered face, the upright carriage, the fearless and almost fierce demeanor of a well-formed gipsy girl, with the veiled features, shuffling walk, and timid, downcast look of a round looking female of the Turkish race. The gipsies conform to the prevailing religion of the country in which they may chance to be. Thus, they are Christians in Wallachia and Moldavia, and, generally speaking, Mussulmans to the southward of the Balkan. Their creed, however, sits loosely upon them; as they follow it no farther than it accords with the habits of their tribe; consequently, those who profess the Mahometan faith are not acknowledged by the more rigid Osmanli, who hates them as infidels, and dreads them as magicians."*

Thus you see, that the gipsies are every where the same vagabond race, every where alike incapable of receiving education. Religion they have none, but adopt, as Major Keppel states, the creed of the country in which they dwell. Music is the only science which they know; and, unchanged by climate, either in habits, complexion, or physiognomy, these

singular people have now, for four centuries, overspread the face of Europe, without any distinct account having been gained of their origin. A cloud has, and probably always will, hang over the descent and first appearance of this most mysterious race.*

HENRIETTA.

Thank you, aunt; I shall now take greater interest in gipsies than I have ever before felt; but how strange that people should be so superstitious about fortune-telling.

MRS. F.

The weak are always superstitious, the greater the ignorance the greater the credulity; but in England, where there are, I believe, fewer gipsies than in any country of Europe, the increase of knowledge among all classes has rendered their pretended arts of little avail; and were they not to pursue some other trade, their skill in palmistry would not suffice to procure them a subsistence. The sanguinary laws which formerly existed against them in England have been repealed. Who recollects the faithful and elegant description of them which is given by Rogers in his "Pleasures of Memory."†

ESTHER.

I do not think that any of us do. Shall I get the book and read it?

MRS. F.

If you please.

"Down by yon hazel copse, at evening, blazed
The gipsy's faggot — there we stood and gazed;
Gazed on her sun-burnt face with silent awe,
Her tatter'd mantle, and her hood of straw;
Her moving lips, her caldron brimming o'er;
The drowsy brood that on her back she bore,
Imps, in the barn with mousing owlets bred,
From rifled roost at nightly revel fed;
Whose dark eyes flash'd thro' locks of blackest shade,

* Bright's Travels in Hungary. † 1st part.

When in the breeze the distant watch-dog bay'd:
 And heroes fled the Sibyl's mutter'd call,
 Whose elfin prowess scaled the orchard-wall.
 As o'er my palm the silver piece she drew,
 And traced the line of life with searching view,
 How throb'd my fluttering pulse with hopes and fears,
 To learn the color of my future years!"

MRS. F.

Thank you, Esther.

FREDERICK.

Aunt, relative to superstition, how much the Romans were influenced by it in their *Sortes Virgilianæ** and *Homericæ*, which were but a kind of fortune-telling.

MRS. F.

Yes, superstition, as one of the old writers says, is the greatest burthen of the world, and the Romans were not exempt from the common weakness. The *Sortes Virgilianæ* and *Homericæ* were succeeded by the *Sortes Sanctorum*, or divinations by the Bible; and this had become so common in the fifth century that it was expressly forbidden by several councils,† though they were never able to suppress it entirely; for in the beginning of the eighth century, when, indeed, ignorance had attained its greatest pitch,‡ we find it preserved, among other superstitious practices, such as divination from the flight of birds, magic, &c.

ESTHER.

But this species of divination is retained by the nations of the East to the present day; and Nadir Shah twice decided upon besieging cities, by opening the poems of Hafiz.

* Charles I and Lord Falkland tried the *Sortes Virgilianæ* when in the Bodleian Library: Charles opened the *Æneis* at b. iv. l. 613., and Lord Falkland at b. xi. l. 152.

† At that of Vannes, A. D. 465; Agde, 506; and Auxerre, 578; and they are again forbidden in 793, by an edict of Charlemagne.

‡ Schmidt.

FREDERICK.

Then there was the Roman superstition respecting the number six.

MRS. F.

Oh! you allude to the saying, "Semper sub sextus perdita Roma fuit," or, "Under six Rome was always lost."

HENRIETTA.

Whence did this idea originate?

MRS. F.

From a singular coincidence of circumstances. Tarquinius *Sextus* was the worst of his race, and his conduct, as you all know, led to a revolution. Under Urban the *Sixth* the grand Schism of the West broke out. Alexander the *Sixth* outvied all his predecessors in wickedness, and it was in his reign that the line above quoted was written. To this we may add another example of the fatal coincidence in Pius the *Sixth*, who was led captive by the French, and treated with ignominy and oppression.

HENRIETTA.

Did not Pius VI live at Fontainebleau during his captivity in France?

MRS. F.

Yes; I have seen the room he occupied; this, and the pen with which Napoleon is said to have signed his abdication, are the two great objects of curiosity shown to the traveller who visits the royal palace.

HENRIETTA.

I heard Mr. Campbell make an observation the other day, when he was playing cards, which I did not understand. He called the nine of diamonds "the curse of Scotland."

MRS. F.

That is a Scottish saying, which originated in the circumstance of the Duke of Cumberland having written, on the eve

of the battle of Culloden, the order for no quarter to be given upon the back of a nine of diamonds, there not happening to be a piece of paper at hand. The story is related in different ways, but it is too unimportant to merit attention.

ESTHER.

Then there is the year 88, which is remarkable as having been fatal to the Stuart family.

HENRIETTA.

How, Esther?

ESTHER.

In 1488, James III lost a battle against his subjects, by whom he was pursued and assassinated.

In 1588, Mary Queen of Scots was beheaded.

In 1688, James II abdicated the British crown; and

In 1788, died Prince Charles James Stuart, the last of the race who made any attempt to recover the English crown.

FREDERICK.

Are there any of the house of Stuart still alive?

MRS. F.

None. Cardinal York, who styled himself Henry the Ninth, and who was brother to Prince Charles, died at Rome in 1808, aged 82.

HENRIETTA.

Who was the Countess of Albany, of whom I have heard speak?

MRS. F.

She was the widow of the young Pretender, who was called in his childhood by that title, which he afterwards resumed on his retirement into Tuscany. The Countess of Albany always bore the arms of England upon her carriage, and assumed the royal liveries. She died in 1824, at Rome, where she had resided the greater part of her life. In St. Peter's repose the mortal remains of the last of this unfortu-

nate race; George IV had a monument erected there to their memory, which, though the work of Canova, is hardly worthy of so great an artist.

ESTHER.

The Stuart family must ever claim our strongest interest, for, I believe, there exists not, in the record of history, a parallel instance of such an unvaried series of misfortune in one family.

MRS. F.

Justly observed, Esther, the greatness acquired by their ancestor* when he married the heiress of Scotland, was indeed a fatal gift to his race, who became, for three centuries, the sport of fortune. Of those who ascended the throne, all passed a stormy life — many met with a violent death.

Robert III, second king of the Stuart family, died of grief.
James I was assassinated.

James II was killed at the siege of Roxburgh.

James III died in battle against his subjects.

James IV was killed at the battle of Flodden Field.

James V died of grief.

Mary Stuart perished on the scaffold, but her son James I passed his life in comparative tranquillity.

Charles I was beheaded.

Charles II was for years, an exile.

James II was compelled to abdicate, and his descendants were excluded for ever, from a throne which had been the source of an uninterrupted series of calamities to their house.

ESTHER.

And then there is the unfortunate Arabella Stuart, first cousin to James I, whose history from her birth to her death seems to be composed of projects of marriage. The factions

* Walter, the fourth of that name, married Mary, daughter of Robert, King of Scotland, and had a son, who became king in 1370, under the name of Robert II.

intrigued to give her a husband, kings and queens watched over her with jealous vigilance to prevent her from having one, and she was treated as a state criminal because she had taken one of her own selection. Both Elizabeth and James treated her with great severity, and her unjust imprisonment by the latter, undermined her reason and terminated her life.*

HENRIETTA.

I shall always dislike Elizabeth for her cruelty to Queen Mary.

MRS. F.

It is, indeed, a great blot in her character. The relative conduct of the rival queens has given rise to much controversy among historians, some advocating the part of Mary, others that of Elizabeth. The character of Elizabeth, as a woman, is much open to censure; her love of admiration, her ungovernable temper, her vanity, her favoritism, all overshadow a character which, when the circumstances of the times are taken into consideration, must be deemed, in many respects, worthy of admiration as a sovereign.

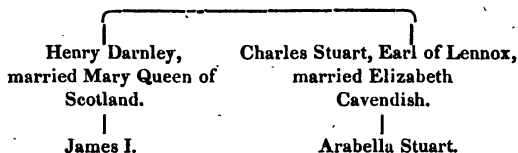
HENRIETTA.

But how very vain she was. I have read that on an indifferent engraving being published of her, she desired that all the impressions might be destroyed, that her subjects might not have such an unworthy portrait of their sovereign.

ESTHER.

And then with respect to dress, she always wore false hair of a red color, and appeared in a different dress every day of

* The relationship was thus :—



the year. She possessed the costumes peculiar to every country in the world, and when she died, nearly three thousand dresses were found in her wardrobe.

MRS. F.

In private, Elizabeth was plain and moderate in her dress, but she loved to make a display of magnificence and splendor, when she appeared in public. She then would wear high shoes, in order to make herself appear taller than she really was; and with the magnificent ruff which bears her name, the royal crown on her head, the golden ball in her left hand, the sceptre in her right, her whole dress one latticework of pearls, glittering in jewels, and surrounded by her no less splendid court, she might well dazzle people with her regal magnificence, when she appeared, thus attired, on the first day of Parliament.

ESTHER.

But what flattery she exacted from every one who approached her, and what absurd answers they were obliged to give, in order to satisfy her thirst for adulation. The Scotch ambassador was required by her to say which bore the palm of beauty, Elizabeth or Mary; and he could only release himself from his awkward predicament by assuring her "that Mary was the handsomest woman in Scotland, as Elizabeth was in England."

MRS. F.

The Spanish ambassador, when asked by Elizabeth what he thought of the ladies of her court, gave an answer well adapted to please the inquirer.

FREDERICK.

What was that, aunt?

MRS. F.

"That it was hard to judge of the stars in the presence of the sun:" and then Sir Walter Raleigh, too, on the occasion of asking the Queen to confer some new favor upon him,

when the Queen replied, "When, Sir Walter, will you cease to be a beggar?" the subtle courtier answered, "When your majesty ceases to be a benefactor."

ESTHER.

A most specious reply.

HENRIETTA.

With all her childish vanity, Elizabeth was a very learned woman.

MRS. F.

Yes; her tutor Ascham places her at the head of the lettered ladies of England of her time. Her proficiency in Latin and Greek is well known; and it is not many years since her translation of Boethius was discovered in the State Paper Office. Her unfortunate rival, Mary of Scotland, also ranks among the learned ladies of the age. When at Paris, she delivered a Latin oration in the hall of the Louvre, with so much grace and eloquence as to fill her hearers with admiration; and Elizabeth, as you probably know, gave answers in Latin and Greek to the addresses of the two Universities. You should read Roger Ascham's letter, in which he gives an account of the proficiency of his pupils, Elizabeth, Lady Jane Grey, Edward VI, and Mary. At that time the ladies of the court studied Latin, Greek, Spanish, French, &c. Indeed, under the example of Sir Thomas More, this more learned education of females had become general. His only daughter, Margaret Roper, shone among the ladies of the age; and when we also recollect the classical education of Lady Jane Grey, of the four daughters of Sir Anthony Cook (the tutor of Edward VI), Elizabeth, Mary, &c., we cannot wonder at the dislike that Henry VIII took to Anne of Cleves, whose accomplishments are thus summed up by a contemporary writer: "She could read and write her own language, and sew very well; as for music, it was not the manner of her country to learn it;" add to this her unprepossessing appearance, it is not surprising that Henry should have so much disliked her.

ESTHER.

But, at any rate, she could work, and that was considered, in those days, a most necessary branch of female education.

MRS. F.

The Anglo-Saxon women were famous for their needle-work, and the English work was celebrated abroad for its excellence. The Anglo-Saxon lady would portray in embroidery the achievements of her husband, and, surrounded by her maids, would astonish even a modern female in the various kinds which she could execute. A lady of rank would often work a whole set of hangings, &c.; and, indeed, by an old custom, women were prohibited from marrying until they had spun a regular set of bed-furniture; and, till their marriage, they were termed *spinsters*, an appellation which is preserved to this day, in the publication of the banns, and in the courts of law.

ESTHER.

I was reading the other day an account of the barbarous murder of the celebrated Hypatia, the most learned lady of her age.

FREDERICK.

Who was she?

ESTHER.

She was the daughter of a mathematician of Alexandria, and filled the office of professor of the Platonic philosophy in that city. Her eloquence was most persuasive, and she counted among her disciples many of the most learned men of the age; but, though the friend of the Bishop of Ptolemais, no persuasions could induce her to become a Christian. Attired in the mantle of a philosopher, modest and humble in her deportment, she soon became an object of jealousy to the envious and the base, and being unjustly looked upon as a bar to a reconciliation between St. Cyril, Patriarch of Alexandria, and the governor of the city, who protected her from

the fiery zeal of the former, she was attacked by some of the most violent partisans of St. Cyril, dragged from the school in which she was teaching, and most barbarously murdered in A. D. 415. Her works perished in the conflagration of the Alexandrian library.

MRS. F.

But it is to Italy that we must look for the ladies most learned in science and philosophy—ladies who have received doctor's degrees, and have filled professorships in Greek, philosophy, and the abstruse sciences; and yet the general state of female education in Italy must be placed at a low standard, notwithstanding these and many other bright exceptions.

HENRIETTA.

Aunt, we should all like very much to hear about these learned ladies.

ESTHER.

Was not Vittoria Colonna one of the most celebrated women of her age?

MRS. F.

Yes; but she is no less remarkable for her feminine virtues and her conjugal affection. Wife of the Marquis of Pescara, who commanded the imperial troops at the battle of Pavia, it was from her advice and exhortations that the marquis had firmness to resist the insidious offers of the opposite party; and distinguished alike for her poetry, her elegant acquirements, and her erudition, Vittoria has equal claim to our admiration for her piety, her industry, and all the softer graces which adorn the female character. Her poetry is the best imitation of the style of Petrarch, and her talents and genius were, in short, of the highest order.

ESTHER.

Then, there is the Venetian lady, Helen Cornaro-Piscopia, who was made in 1678 doctor of philosophy in the University of Padua. She understood French, Spanish, Latin, Greek,

Hebrew, and Arabic, sang the verses which she herself composed, and discussed with eloquence on mathematics, music, astronomy, theology, and the most abstruse points of philosophy.

MRS. F.

Yes; she died at the early age of thirty-eight, and under the vestibule of the University of Padua I have seen the marble statue which is erected to her honor, and in which she is represented in the habit of St. Benedict, of which austere order she followed the rules, although she always lived in the house of her father. But it is Bologna which bears on its list more female doctors than ever appeared at any university — Novella d'Andrea, Tambroni, Bassi, and Agnesi, all of whom filled the chairs of different professors.

FREDERICK.

Pray tell us more about them, aunt.

MRS. F.

The beautiful Novella d'Andrea belongs to an earlier age than the others; she was the eldest daughter of the most celebrated professor of canon law in the fourteenth century. The degree of doctor was conferred upon her by the Academy of Bologna, and she frequently filled her father's chair; but lest her beauty should disturb the attention of her auditors, she had a little curtain placed before her, whenever she taught in the schools.

ESTHER.

Next comes Clotilda Tambroni, who filled the chair of the Greek language at Bologna.

MRS. F.

And then the no less celebrated Laura Bassi, a native of that city, and daughter of a doctor of laws. She early evinced a passion for study, and at the age of twenty-one, publicly sustained a thesis in philosophy, and answered her opponents in the most elegant Latin. She soon after received the doctor's degree; and the same year the chair of philosophy,

with the most honorable appointments, was bestowed upon her. She equally excelled in algebra, geometry, physics, Greek, poetry and the belles lettres, and is described by a contemporary as singularly gentle and modest in her deportment, serious and unaffected, of a vigorous memory, accompanied by solid judgment and a lively imagination. She died in 1778. The last learned Italian to whom I shall now allude is the celebrated Milanese lady, Maria Agnesi, who died in the last year of the last century. She understood Latin at nine years old, and soon acquired Greek, Hebrew, French, German and Spanish. At the age of nineteen she supported a hundred and ninety-one theses, and continued so to distinguish herself that, on her father being ill, she obtained permission of Benedict XIV, to supply his chair of mathematics at Bologna. She subsequently retired from the world and devoted the remainder of her life to charity and benevolence.

ESTHER.

Thank you, mamma.

MRS. F.

I have now finished my catalogue of the ladies of Italy, although there are, perhaps, many others that might be enumerated. But in the nineteenth century, our own country stands pre-eminent in the annals of female science; and were it not in opposition to the retiring feelings of one who is humble as she is learned, a doctor's degree or a professor's chair might now be bestowed with equal justice upon an English lady as it was conferred upon those of Italy; but though eligible for the highest honors that science can offer, she is more content to shine in the path of domestic life, affording to us all a striking evidence that talents and pursuits of the highest order are not incompatible with a strict discharge of the relative and social duties.*

* Her "Connection of the Physical Sciences" will, of course, be in the library of the youthful reader.

HENRIETTA.

Then, aunt, you do not object to learning in women?

MRS. F.

Where a woman is gifted with talents and capacity to aspire to the higher walks of learning, I see no objection to her following them: but recollect that it is with the Bible in our hands that we must enter the gates of science, and when accompanied by religious principles, and pursued with religious views, there is no fear of it becoming the knowledge "that puffeth up;" but rather, under higher guidance, it may lead from worldly wisdom to that which will alone make us "wise unto salvation."

CHAPTER XVI.

A MORNING WALK.

POLITENESS. — SILK-WEED. — PEAT MOSS. — SUN DEW. — MOSSES. —
 TAR, PITCH, ETC. — STONE PINE. — RAVENNA. — WOOD OF THE
 VINE. — DUCK'S NEST IN A TREE. — ROBIN'S CUSHION. — GALL
 NUT. — MISTLETOE OF THE DRUIDS. — CHARCOAL BURNING. —
 DERIVATION OF SEVERAL SAXON WORDS. — ON THE STUDY OF
 THE SAXON LANGUAGE. — FERNS, EATABLE. — CAPILLAIRE PLANT.
 — FERN SEED. — FUNGI, EATABLE. — DRY ROT. — GLOW-WORM.
 — CLEANING INSTRUMENT. — CLAWS OF BIRDS. — PROCRASTINA-
 TION.

Needs no show of mountain hoary,
 Winding shore or deepening glen,
 Where the landscape in its glory
 Teaches truth to wandering men.
 Give true hearts but earth and sky,
 And some flowers to bloom and die, —
 Homely scenes and simple views,
 Lowly thoughts may best infuse. — KEBLE.

ESTHER.

COME, Henrietta, we are all waiting for you.

HENRIETTA.

Can any one tell me where my bonnet is? Frederick, do
 you know?

MARY.

How should he be able to tell?

FREDERICK.

Henrietta asked me to take it up-stairs for her, and I said
 that I would presently; but I quite forgot it, and it must still
 be in the hall.

MRS. F.

The evil consequences of untidiness on the one side, and of procrastination on the other. You, Henrietta, should not have left your bonnet about; and you, Frederick, having promised to put it away, should have done so immediately. Few habits are productive of greater inconvenience than that of putting off what we have to do. In the first place, it often, when deferred, entirely escapes our memory; and even should it not, I think that the act ceases to be one of real kindness, if we consult our own convenience in the time of performing it.

FREDERICK.

I do not quite understand that, aunt.

MRS. F.

Politeness has been justly designated to be "refined good nature." It does not consist in mere acts of form and ceremony, but in a total absence of all selfish feeling, and a consequent desire to please and oblige others, whatever the personal sacrifice may be. I therefore consider selfishness and real politeness to be incompatible, for my idea of politeness takes a wider range than that which is usually conveyed by the ordinary acceptance of the word: but here is Mary, with Henrietta's bonnet; so we are now ready. I propose taking a walk to the farm, and we will go through the wood, as it will be less dusty than by the road.

HENRIETTA.

Pray stop, aunt, and look at the pretty brooms which this little girl has brought to sell; she calls them silk weed.

MRS. F.

They are made of *Polytrichum commune*, which grows abundantly on the heaths about here. It is the largest species of moss known, excepting an exotic kind (*Timmia longiseta*). In this country, the silk-weed seldom exceeds a span in length, but in Alsace, we are told that it will sometimes attain the

height of half a yard.* Take some of the little girl's brooms, Esther; and we will examine the moss, more at our leisure, when we return.

ESTHER.

But the common peat moss (*Sphagnum*) is also very long.

MRS. F.

Under peculiar circumstances, it will attain a great extent, it having been found by Dr. Greville, in a pool of water, a foot and a half long.† The *sphagnum* is one of the most abundantly diffused of all the mosses, and its whitish hue (tinged however with red, when the water has dried up and left it exposed to the action of the air and sun), makes its appearance very remarkable and distinct from all other genera. All the species are aquatics, and the *sphagnum palustre*, from its rapid growth, and from its property of throwing up new shoots in its upper part while the lower parts are decaying, is supposed to constitute a considerable portion of the great bogs of the North of Europe. In Alpine countries, most of the springs take their origin in large marshy plains, covered with sphagnum. Its softness, its cotton-like texture, its facility of absorbing moisture, and the ease with which it is procured, render it fit to be applied to many purposes. The Lapland women make great use of it, and it would form a soft and delicate mattress or lining for the cradle of a child.‡

ESTHER.

I think it has been always upon this moss, that we have found the curious little sun-dew, (*Drosera*).

MRS. F.

Yes; and that still more singular plant of the same family, Venus' fly-trap (*Dionæa muscipula*), with whose irritability you must be all familiar, grows among the sphagnum; so does also the purple *Sarracenia*, and many other plants which are difficult of cultivation in our gardens.

* Sprengel. † Hooker's *Muscologia Britannica*. ‡ Lamouroux.



Dionæa Muscipula.

ESTHER.

I read, the other day, that the sun-dew has the same appellation in French, *rosée du soleil*; and also in Latin, *ros solis*; the plant deriving this designation from the glandulous hairs which glitter upon its surface, and give the appearance of being covered with dew.

MRS. F.

I am glad, Esther, that you take interest in the study of the mosses; for though among the smallest of vegetables, yet their structure is so curious and so complicated, as to form a fertile subject of interesting investigation. The variety of soil and climate in the different parts of the British islands gives us a larger number of species than, perhaps, is to be seen upon a like extent of country, in any part of Europe. The latest works enumerate about 290 British species. They chiefly delight in damp and shady situations; but they are by no means exclusively confined to these places of growth. — Moss is found upon the stem of the cocoa nut, and others have been even gathered on the burning sands of the deserts, in the interior of Africa. In the Alps and Pyrenees, they are found at an elevation of 7000 to 8000 feet; on the northern border of Siberia, the entire soil is covered for a great extent with mosses; and the rocks of Spitzbergen and Greenland, and

the coasts of the Icy Sea, are covered with them. Thus, from the Equinox to the Poles, there is scarcely any part of the world destitute of mosses; and the universality of this tribe, their disposition to grow where other plants are incapable of existence, makes the study of them, to my mind, the more interesting, as it enables us to find sources of interest and instruction, where the inexperienced, unobservant eye would see nothing but a barren waste.

ESTHER.

The trunks of trees, especially to the north side, have an abundant covering of mosses; and these, to the observant natives of the American wilds, are sure guides for the points of the compass, and thus serve to direct them through their pathless forests. This clothing is doubtless given to protect the bark from the inclemencies of the winter, and also to afford shelter to various tribes of insects which take refuge there in all seasons of the year; and the entomologist, by examining these tufts of moss, will find an abundant harvest of rare species to reward him for his labours;* so thickly is creation animated, so truly is it that nothing is made in vain.

HENRIETTA.

Look how the juice is running from that tree.

MRS. F.

That is turpentine, which is exuding from the Scotch fir (*Pinus sylvestris*), the only British species of this numerous genus; but one of the most useful of them all, as, independent of turpentine, it gives us tar and pitch.

HENRIETTA.

How is tar made?

MRS. F.

The wood is cut into billets, and placed in a mound about

* Hooker.

eight feet in height, and thirty in diameter. This is covered with earth, and set fire to, at the top, similar to the process of charcoal burning. It is suffered to burn slowly with the imperfect access of the air; the tar runs off by a ditch made to conduct it, and is collected into barrels. Pitch is tar reduced by evaporation. Pitch, mixed with oil and suet, makes *shoemakers' wax*. The wood of the Scotch fir is the red deal, of the Norway spruce (*Pinus abies*) the white deal. From the latter the Burgundy pitch is obtained.



Scotch Fir.

ESTHER.

The Laplanders also make bread of the bark of the Scotch fir. After selecting the tallest and least branching trees (as containing less resinous juice), the external bark is carefully removed, and the soft, white, fibrous, and succulent matter collected and dried. When about to be converted into use, it is slowly baked on the coals, and thus rendered porous and hard. It is then ground into powder, kneaded with water, and made into cakes, which are baked in an oven, and which the Laplanders eat during the greater part of the winter, and sometimes during the whole year.*

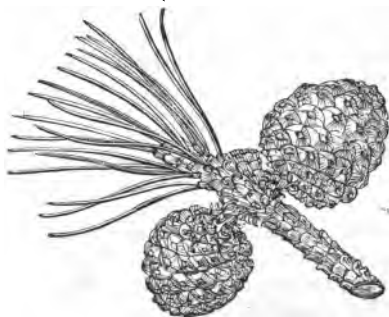
*Medical Botany.

MRS. F.

The word pine is derived from *pen* or *pin*, a crag or stony mountain, upon which the pine delights to grow: but who can tell me what that large fir tree is on the right?

ESTHER.

Is it not the stone pine (*Pinus pinca*)?



Stone Pine.

MRS. F.

It is: this is the tree which produces the large seeds which are so much eaten in Italy, where they are called *pignoli*. — In Naples particularly, they are extensively used, and the people in the streets may be seen roasting the cones before the fire, in order to cause the scales to expand, and enable them to get at the seeds, which are as large as almonds.* — This is the cone which we see placed in the Thyrsus of Bacchus, it being used as his emblem, from the circumstance of the ancients putting turpentine into their wines, in order to give them a flavour.

* The seeds of *Araucaria imbricata* form the entire subsistence of an Indian tribe, who harvest them, and bury them in pits for winter use.

ESTHER.

This, I suppose, is the pine which we constantly see depicted in the landscapes of the Italian painters.

MRS. F.

It is. This species is abundantly diffused over Italy, and near Ravenna there is a large forest of stone pines, called the *Pineta*, which, in the time of Augustus, furnished timber for the Roman fleet; but which is, in modern times, more celebrated as having been the favorite walk of Dante, its gloomy foliage being well suited to the meditation of the author of the *Divina Commedia*.*

ESTHER.

Ravenna must be a very interesting place.

MRS. F.

It is, indeed. Honorius, as you recollect, made it the seat of the western empire. It was successively taken by Odoacer and Theodoric; restored to the empire by the armies of Belisarius and Narses; in 568 became the residence of the Greek exarchs; again fell a prey to the barbarians, when taken by Astolphus, king of the Lombards, in 752, and an end put to the exarchate. Astolphus was dispossessed by the arms of Pepin who gave Ravenna to the church in 755; since which period, it has often changed masters, but was restored to the Pope in 1509, when it became the residence of a cardinal legate.

ESTHER.

I suppose Ravenna is full of historical recollections.

MRS. F.

In no city are more remains to be found of the works of the Lower Empire, and the number of domes and towers which are to be seen at a distance, give the city quite an oriental appearance. Here is a curious octagonal basilica, built under Justinian, in imitation of the church of St. Sophia,

* Dante refers to the *Pineta* in *Purgatorio*, c. xviii. l. 20.

and the vault represents, in large mosaic, the emperor, with Theodora and their court. The churches of Ravenna are full of Byzantine remains, and the cathedral contains the font for total immersion, the *ambones*, (or two pulpits in which the Epistle and Gospel were read), the Paschal chair, and many remains of the manner in which the interior of the churches was arranged in the primitive ages of Christianity, of which we also find some specimens still existing at Rome. Near Ravenna is the celebrated church of St. Apollinarius, the only building which remains of the ancient town of Classe, formerly the port of Ravenna. In this church we have a series of portraits of all the archbishops of Ravenna, 126 in number, from the first contemporary of St. Peter, to the present time; such as we have at St. Paul's, at Rome, of the Roman bishops and popes.

ESTHER.

Is not the tomb of Theodoric also here, of which the dome or roof is composed of a single stone?

MRS. F.

It is; and so is that of Dante, a most unworthy monument to so great a man. These are a few of the objects of interest at Ravenna; and when we also recollect, that near it was fought the battle so glorious to France, but so fatal to Gaston de Foix and the flower of French chivalry,* we must admit that Ravenna presents a series of historic recollections, which give a peculiar character and interest to the place.

ESTHER.

I think that I have heard you mention that on the doors of the cathedral at Ravenna are nailed several planks of the old ones, which they replace; and that these planks, which are of the wood of the vine, are most of them a foot in diameter.

MRS. F.

Yes, they are quite as large as you state; an extraordinary size for the vine to attain.

* Battle of Ravenna, fought on Easter Sunday, 1512.

"Oh, aunt," said Frederick, who had run on before them, "look what I have found, a duck's nest in a tree!"

The party hastened to the spot, and found the nest of a duck, with some egg-shells still remaining in it, perched up in an oak tree, about ten feet from the ground,* and the duck and its little brood were to be seen swimming in the pool adjacent.

MRS. F.

I have before heard of similar instances of ducks building in trees, but this is the first which has ever come under my own immediate notice. The wonderful part of the circumstance is, how the duck contrives to get her young ones down from so great a height, unless she carries them upon her back, as we see swans sailing about with their little progeny. It is a point I long to ascertain; but I have never met with any one who had witnessed the manœuvre, and could tell me how it is effected.

ESTHER.

Frederick, I will thank you to bring me one of the egg-shells, as I should like to keep it as a memorial of the incident.

FREDERICK.

I will, Esther, in a minute; or I can do it going back.

MRS. F.

You had better get it now.

FREDERICK.

Oh no, aunt; I will remember it.

MARY.

I, too, have found something—such a pretty robin's cushion.

MRS. F.

The bedeguar, as it is sometimes called, the work of one

* Fact.

of the gall insects (*Cynips rosæ*), which pierces the brier, in order to deposit its eggs; the sap flowing from the part that has been pricked forms this excrescence, which is of the same nature as the gall nuts of the oak. The gall nut of commerce (*Diplolepis gallæ tinctoriæ*,) comes from the Levant.

HENRIETTA.

Frederick, when you climbed into the oak, you should have looked for some mistletoe.

MRS. F.

He would have had but little chance of finding it, for it is rarely, if ever, found upon the oak, but generally upon the hawthorn and the apple-tree. Indeed, this circumstance, combined with others, has led De Candolle to think that our mistletoe (*Viscum album*) is not the plant of the Druids. He says, that he has travelled all over France, and all the neighboring countries, and has seen the mistletoe growing on every kind of tree,* excepting upon the oak; while, on the contrary, he has found, in the environs of Parma, *Loranthus Europæus*



Loranthus Europæus.

growing spontaneously upon every species of indigenous oak; and this plant so clearly resembles the mistletoe in appearance, that it has received the same common appellation, and may easily be mistaken for it. If the mistletoe had existed upon the oak at the time of the Druids, there is no reason

* Even upon the fir. Mr. Arundell, in his travels in Asia Minor, observed the mistletoe upon the willow.

why we should not still find it so growing in France; but if the mistletoe of the Druids was the *Loranthus*, we can easily conceive that it may have been destroyed in those provinces where the Druidical worship was in full force, and that it now only exists in those where the plant has not been exterminated by frequent cutting.*

The party had now reached the farm, where they found two men busily employed in burning charcoal.

MRS. F.

This is an unusual season of the year for this operation, which is generally performed in the spring. While I speak to the bailiff, you can amuse yourselves in learning the process by which charcoal is made.

The young people speedily questioned the charcoal burner, who explained to them how he arranged the billets of wood round a centre, in a kind of conical form, and then covered them with sand, in order to prevent the admission of more atmospheric air than sufficed to keep the fire alive. They saw him carefully cover in every little aperture by which he perceived smoke escaping; he told them the time the wood took in charring, which varied, according to its quality, age, &c., from one to three days, during which time he was obliged to watch it day and night; and having heard the whole operation fully explained, the young people rejoined Mrs. Fortescue, who was now ready to return home.

ESTHER.

Seeing the charcoal, reminds me of the expedient used in the American ships for preserving ice.

HENRIETTA.

What is that?

ESTHER.

A double frame-work or case is made of boards, and in the space between them, charcoal is rammed down as closely as

* De Candolle, *Proprietes des Vegetaux*.

possible. Charcoal being an imperfect conductor of heat, the ice is thus preserved for a length of time.

MRS. F.

Sand, also, is so slow a conductor of heat, that the red-hot balls used at Gibraltar in repelling the attack of the Spaniards, were conveyed from the furnaces to the bastions, in wooden wheelbarrows, having only a layer of sand between them and the balls.

ESTHER.

Mamma, what is the derivation of the word charcoal?

MRS. F.

It is derived from an Anglo-Saxon verb, which means *turned, turned about, or turned backwards and forwards*. Thus charcoal is wood *turned* coal by the fire; churn, a vessel in which the milk is *turned about*; and charwoman, commonly written chairwoman, is one who does not abide in the house where she works, as a constant attendant, but *returns* home to her own place of abode, and *returns* again when required. To set a door or window *achar*, or as some write it *on char*, and as we term it *ajar*, is to put it neither quite open nor quite shut, but on the turn or *return* to either.*

ESTHER.

Thank you, mamma; I should like very much to learn Saxon.

MRS. F.

It were much to be desired that the study of Anglo-Saxon formed a branch of education, for it constitutes the basis of our language, of which a greater majority of words are Saxon than would be easily believed. Of the sixty-five words which compose the Lord's Prayer, there are only five that are not Saxon. Of eighty-one words in the soliloquy of Hamlet, thirteen only are of Latin origin. Even in a passage of ninety words of Milton, whose diction is more learned

* Diversions of Purley.

than that of any other poet, there are only sixteen Latin words. In four verses of Genesis, which contain about a hundred and thirty words, there are no more than five Latin. The language of familiar intercourse, the terms of jest and pleasantry, the idioms, the proverbs, the particles — all these foundations of a language are more decisive proofs of the Saxon origin of ours, than even the great majority of Saxon words in writing, and the still greater majority in speaking.*

ESTHER.

But there are a great number of Latin, Greek, and French words in our language.

MRS. F.

So there are, in the modern writers; but look at Dryden and Addison, at the writers before the restoration, and you will see the difference. The prophecy of an old writer is come to pass, and "we are now forced to study Latin, in order to understand English." The complaint, therefore, is not new, though the practice complained of is becoming more frequent. "To speak as the common people speak, and to think as the wise think," was the advice of Aristotle; and where can we find more simple and more natural language than in our admirable translation of the Scriptures, which affords us a pure model of genuine English. The most effectual method of preserving our language from decay, and preventing a total disregard to the Saxon part of it, is to change our present mode of education.† Let children be early taught the Saxon language, in order the better to enable them to understand their own; for they never can thoroughly arrive at the meaning of a word if they only seek for its derivation in the Latin or French, instead of tracing it to Saxon, its true and original root.

HENRIETTA.

Frederick, what is that you have in your hand?

* Sir James Mackintosh.

† Sharp's Letters and Essays.

FREDERICK.

Merely a piece of fern taken close to the root. You will see, when I cut it across, what an excellent figure it makes of an oak tree.

MARY.

So it does. I never saw it before. There appears to be a great variety of ferns in the wood; what is this one, mamma?

MRS. F.

It is the common brake (*Pteris aquilina*), which contains so much potash that the ashes of the burnt root are made into balls, and used as a substitute for soap.* Like many other of the ferns, it contains tannin, and is employed in dressing leather, &c.

ESTHER.

Is not one species of *Pteris* eatable?

MRS. F.

Yes; several of the ferns contain a considerable proportion of saccharine matter, gelatine and mucilage. The inhabitants of New Zealand feed upon the roots of *Pteris esculenta*, *Cyathea medullaris*, and *Polypodium dichotomum*, and in the East Indies the same part of *Diplazium esculentum* is used for food.† Nor must we omit to mention the Capillaire plant (*Adiantum pedatum*) used in the south of France to make the syrup so called, which is perfumed with orange flower.

ESTHER.

How very minute the seeds of the fern are.

MRS. F.

Yes; Shakspeare alludes to their being so uncommonly fine as to be almost invisible, when he says, "We have the receipt of fern-seed; we walk invisible." Fern-seeds were formerly gathered the night before Midsummer, and made use of for magical incantations.

* Sprengel.

† Ibid.

ESTHER.

Aunt, what is the kind of tinder called *amadou* made from?

MRS. F.

From one of the numerous family of Fungi. *Boletus foventarius* is the species most commonly used. Several of these Boleti are eaten on the Continent, under the name of *ceps* (*Boletus edulis*, *xereus*, &c.) They cut them in strips, and dry them, in which state they are sold in the market.

ESTHER.

But in France and Italy, they eat a great many species of Fungi which we do not venture to touch here.

MRS. F.

Yes; of the genus *Agaricus*, (to which the common mushroom (*A. campestris*) belongs,) they eat from five-and-twenty to thirty species; of *Boletus* upwards of six; several *Amanita*; besides many of *Merulius*, *Clavaria*, *Helvella*, *Peziza*, &c.; but so strong is the poisonous nature of this tribe, and so difficult is it to recognise the species from mere description, that we cannot be too careful in eating them indiscriminately. In Paris, inspectors are appointed, who visit the markets, and examine every fungus which is brought there for sale.* The Morel (*Morchella esculenta*), and Truffle (*Tuber cibarium*), I have not mentioned, because you must have often seen them, as they are both found in England; the latter, abundantly in Sussex, where little dogs are trained to discover them. The fungus which produces the dry-rot in timber is *Agaricus lachrymans*.

FREDERICK.

Aunt, look at this strange looking kind of caterpillar, with a snail shell fastened to it.

* The most esteemed species in France are the common mushroom, l'orange vraie (*Agaricus aurantiacus*); Orange blanche (*Agaricus ovoïdes*); the two Mousserons (*Agaricus mousseron* and *pseudo mousseron*); the Chantarelle (*Merulius cantharellus*); the Ceps (*Boletus esculentus*), and the Giorole (*Clavaria coralloïdes*).

MRS. F.

I see, it is the larva of the glow-worm. The nature of its food was long a matter of doubt, until Mr. Rennie discovered that it will touch no animal except small snails. It thrusts its long head into the shell, and does not withdraw it until it has devoured its inhabitant.

FREDERICK.

But look, aunt, it has now dropped the shell, and is turning its tail over its back just like that animal which we call at school "the Devil's coach-horse."

MRS. F.

The animal to which you allude (*Goërius oleus*), as well as the earwig, is said to apply its forked tail in assisting to unfold its long and closely folded wings; but this is not the case with the glow-worm, the tail of which is furnished with a most singular instrument, consisting of a double row of cartilaginous rays, disposed in two circles, like a little brush, and retractile like the horns of a snail, but acting by suction. The grub cannot well devour a snail without being covered with its slime, and accordingly, after every repast, it goes carefully over its head, neck, and sides, with this cleansing instrument, in order to free them from slime. This instrument is moreover furnished, in the inside, with a sort of pocket, of a funnel shape, into which are collected all the dust, &c., which it brushes off, till the funnel can contain no more, when, by a movement of the animal, the pocket is emptied, and the pellet of dust carefully placed out of the way.*

HENRIETTA.

This is most curious indeed.

ESTHER.

I have often seen the common house fly cleaning itself.

* Rennie, in Journal of Royal Institution, Oct. 1820.

MRS. F.

Yes; it is furnished with a kind of comb on its legs, with which it performs the office. Did you ever see the serrated claw of the Goat sucker? (*Caprimulgus Europæus*.)

HENRIETTA.

Never, aunt.

MRS. F.

Then I will show you a representation of it when we go home. This comb serves them to clear the plumage of their heads from the insects which infest them; and, indeed, most birds use their claws for similar purposes; and it is remarked, those birds which cannot conveniently reach their heads, such as ducks, martins, &c. are those which suffer the most from vermin; and, indeed, we may remark with regard to our domestic poultry, that when they run in a stony or gravelly yard, they wear away the points of their claws, by scratching and digging, and are in consequence disabled from cleaning their feathers, which renders them less clean and healthy than fowls which run at large.

ESTHER.

I suppose the same kind of cleaning is performed by the spider and the ant.

MRS. F.

I believe so. We also continually see cows and horses cleaning each other's necks and heads, which the individual cannot reach itself with its tongue; and in the same way, caged birds will often assist each other in the same operation.

ESTHER.

The cat also cleans itself and its kittens, not only with its claws, but with its tongue, which is just like a currycomb.

MARY.

Yes. In the Library of Entertaining Knowledge* there

* Menageries, vol. i. p. 179.

is a magnified representation of the tongue of a lion, and I suppose it is the same in all the feline species.

HENRIETTA.

But, all this time, we are forgetting our glow-worm, which I hope has not run away; for I intend taking it home, and putting it in a box with some snails, that we may watch it clean itself with its little brush.

MRS. F.

And you shall have my microscope, that you may examine it the more closely.

HENRIETTA.

Thank you, aunt; that will be very interesting.

FREDERICK.

Here is the glow-worm; Mary; I will carry it for you, and you can take the little snails.

MRS. F.

I think that I had better take charge of it, for you, Frederick, have Esther's egg-shells to carry.

FREDERICK.

Oh, aunt, I had quite forgotten them.

MRS. F.

Just what I anticipated, when you said that you would take them *presently*. Another instance, my dear Frederick, of the inconvenience of a habit of procrastination — so often do we seriously annoy ourselves and others, by deferring until another time that which could just as well be done at the present.

FREDERICK.

Aunt, I will run back and fetch them now.

MRS. F.

Do so; but strive, by all means, to correct yourself of this

pernicious habit, for you will soon carry it into the more important concerns of life, when it may prove of the most dangerous consequences.

FREDERICK.

But aunt, I should never put off any thing of real consequence.

MRS. F.

So you think; but habits once formed are not so easily shaken off, and the same procrastinating disposition which led you to leave the egg-shells this morning, would cause you to defer higher and more serious concerns. Beware then, above all things, of acquiring bad habits; they are of the utmost ease to acquire — of the utmost difficulty to break; for, as Johnson truly observes, “minutest, but strongest of all chains is the chain of habit.”

CHAPTER XVII.

PEARL OYSTER.—ENGLISH PEARLS.—AGE OF OYSTER.—GREEN OYSTER.—OYSTERS OF LAKE FUSARO.—PILGRIM'S SCALLOP.—VENUS MERCENARIA.—PHOLAS.—SOLE.—TELLINA.—CARDIUM.—COWRIE, DIFFERENT SPECIES.—COLORING MATTER OF SHELLS.—HELIx JANTHINA.—BULIMUS—PERIWINKLE.—STROMBUS GIGAS.—CAMEO.—NAUTILUS.—PORCELLANEous AND MOTHER-O'-PEARL SHELLS.—TEMPLE OF SERAPIS.—TEREDO.—SPONGE FISHERY.

“Lo! these are but a little portion of His wonders. Every shell is like an open book; every painted sea-weed has a lesson written in its leaves. God is in every place; He speaks in every sound we hear; He is seen in all that our eyes behold.”

FREDERICK.

ESTHER, I have been looking over your collection of shells, and I wish you would come with me, and tell me some things which I want to know.

ESTHER.

With pleasure.

HENRIETTA.

Then, in the first place, which is the oyster that produces the pearl?

ESTHER.

It is this (*Mytilus margaritiferus*). The pearls from Ceylon are, I believe, considered the best. The fisheries are commonly rented by one individual, who is allowed to employ a hundred and fifty boats for thirty days. The 20th of February is the day of *rendezvous*; the banks cover a space of thirty miles by twenty-four; and six thousand people are em-

ployed. The greatest depths produce the finest pearls; and a diver will collect from one to four thousand oysters a day.

HENRIETTA.

In what part of the shell is the pearl?

ESTHER.

The finest are situated in the fleshy part of the hinge. Pearl appears to be a formation forced upon the animal by some annoying substance in its shell, which it covers with mother-o'-pearl, as the bees invest intrusive wasps or snails with wax, to fix them and prevent them from putrifying.

HENRIETTA.

But pearls are sometimes found in England.

ESTHER.

Yes; but they are not produced by the same animal, but by the *Mya margaritifera*. Cæsar, on his return from Britain, offered up in the temple of Venus, a corslet of British pearls. The river Conway was celebrated for its pearls, and a large one was taken in this river, and presented by Sir Richard Wynn, the Chamberlain, to Catherine, consort of Charles II, and is said still to adorn the British crown.

HENRIETTA.

This is the common oyster (*Ostrea edulis*).

ESTHER.

Yes it is. Of the purpose to which the oyster shell was applied by the Athenians, I need hardly remind you; but do you know, Henrietta, how to distinguish an old from a young oyster?

HENRIETTA.

No.

ESTHER.

Its age is seen by the distance of the circles of laminæ of the convex valve, or under shell of the oyster; this lower

valve often forms a beak of considerable length as the animal increases in age. An oyster is not fit for table until it is a year and a half old.

HENRIETTA.

But what are the green oysters?

ESTHER.

The green oysters which we see at Paris are, I believe, chiefly from Rochfort, and it is supposed that the marine plants upon which they feed, the growth of which is favored by the tranquillity of the water in the oyster banks or pits, stain them of this hue. The most celebrated French oyster pits are at Ostend; the English at Milton and Colchester; and the Romans used to send to Sandwich for their oysters, as they did to Minturnæ for their shrimps, and to Alexandria for their prawns.

HENRIETTA.

What epicures!

ESTHER.

I have heard mamma describe the oyster beds in the lake of Fusaro.

HENRIETTA.

Where is that?

ESTHER.

It is near Naples, not far from Cuma; and, according to the ingenious theory of a learned Italian, it is the Acherusian shore where Æneas found Charon and his boat. This lake communicates with the sea, and is now one vast oyster bed, which entirely supplies Naples with oysters. It is the property of the king, who lets it out on leases of six years, for seven thousand ducats (about 1400*l.*). The lake is shallow, and the oysters are distinctly seen at the bottom; a quantity of canes are placed in the water, and the oysters which adhere to them are considered the best, and are reserved exclusively for the king. In the same lake mamma

saw a quantity of gray mullet (which the Italians call *cefali*). They are enclosed in a reed fence, and the spearing of these poor imprisoned fish is a regal sport. Wild boars, too, for the king's hunting, she saw in a copse of juniper and alaternus adjoining; and so tame are the creatures, that they ran up to the men, who held out a sieve of corn to feed them, as quietly as if they had been common pigs. But here, Henrietta, is the scallop-shell of the pilgrims (*Pecten maximus*); or, as it is called in Spain and Portugal, the shell of St. James, because that apostle is always represented with a scallop-shell in his hat, and the pilgrims to the shrine of St. James of Compostella, in Galicia, wear these scallops upon their cloak and hat. But the scallop has always been the pilgrims' ensign in their pilgrimages to holy places, and was of such a distinguishing character that Pope Alexander IV, by a bull, prohibited giving the use of them except to pilgrims who were truly noble. They are of very frequent occurrence in heraldry. You recollect Parnell's Hermit:

"He quits his cell; the pilgrim's staff he bore,
And fixed the scallop in his hat before."

HENRIETTA.

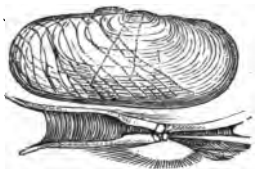
And what are these pretty shells?

ESTHER.

This drawer contains the genus *Venus*, which, in calm weather, may be seen sailing upon the surface of the water, using one of their valves as a boat, and the other as a sail. These shells are more numerous, and more varied in warm climates; but there are two species which we find upon our own shores; one of them (*Venus mercenaria*) is cut into cylindrical beads, some white and some black, by the North American Indians, of which they form their wampum, or treaty belts,* which are the symbols of friendship with them. They also use these shells for money, and the women cover

* There is a detailed description of the wampum in the notes to Gertrude of Wyoming.

their dancing shoes with them, so as to produce a tinkling noise.



Solen.

HENRIETTA.

Here is the razor shell (*Solen*), which Frederick and I have often picked up by the sea side.

ESTHER.

It is. These animals burrow in the sand of the sea shore, and bury themselves in a vertical position, sometimes two feet below the surface. This is a stone-boring animal (*Pholas*), which you may often have seen in the rocks.

HENRIETTA.

Indeed we have; for we were never able to get one out perfect, they are so wedged in.

ESTHER.

Yes; these animals pierce wood and stone, or bury themselves in the sand. The shell, as you know, is very fragile; but the animals seldom leave the hole which they have bored. They are sought as an object of food.

HENRIETTA.

Cannot the common cockle (*Cardium*) also bury itself?

ESTHER.

It can. "This faculty of being able to sink, when alarmed, with considerable rapidity, and being able to rise again to the surface of a mass of sand heaped upon them, are the means of defence given to these shells to guard them from the violence of the breakers of our coasts. The hurricane

may expend its fury in vain, and may sweep away even the upper part of the banks of sand, or may roll pebbles over them; but, gifted with this means of retreat and protection, these testacea are enabled to remain below secure and uninjured."

HENRIETTA.

And here is a little shell which I have often picked up.

ESTHER.

It is a Tellina, of which several species are found on our coast. I have heard mamma often speak of a place near Broadstairs, called Shellness, where these shells had accumulated in such abundance that they might be carried away by sacks full; but I have since heard that, from a change in the currents, or some other cause, the shells have entirely disappeared from the place. There is also a spot not far from Shellness, called Pegwell Bay, which is celebrated for the number of cockles (*Cardium*) which are found there. Are you aware that the common cockle (*C. edule*) can leap? and so indeed can the pecten.

HENRIETTA.

No; I never heard of it before.

ESTHER.

They are enabled to do so by means of their expansile foot, a structure which is common to a great majority of the mollusca, the only instance, I believe, in nature, of a unipede, or one-legged organisation. It serves both as a leg and as a hand. By means of it, some species spin a byssus;* while others use it as an auger; others as a trowel; others as their organ of locomotion.

HENRIETTA.

Here is the drawer with the cowries (*Cypræa*). How beautiful they are! the only plain-looking one among them is our little English species (*Cypræa stolidæ*).

* See Chap. XI.

ESTHER.

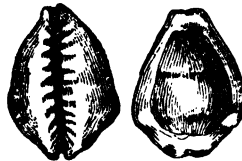
Yes; it is but an humble type of its more brilliant congeners of the tropics; for in shells the intensity of coloring decreases as their locality approaches the poles, in the same manner that vegetation is influenced by its proximity to the tropics. The less a plant is exposed to the sun the paler its colors, the fainter its smell, the weaker its flavor. Odoriferous herbs are found in the greatest perfection in those countries where the sun-light is strongest, such as sweet herbs in Barbary and Palestine, and tobacco in Persia; and the peach, the vine, and the melon, no where acquire such a flavor as under the brilliant sun of Cashmere, Persia, Italy, and Spain.*

HENRIETTA.

Is not this the money cowrie (*Cypræa moneta*), the current money of Bengal, Siam, and Africa?

ESTHER.

It is. These shells are picked up by the negro women of the Indian islands about the full of the moon, when these animals are said to quit their retreats under the sea at some distance from the shore, and traverse the rocks. *Cypræa aurantia* is worn in the Friendly Islands as a mark of the highest rank, and the African women make fringes of cowries to ornament their dresses.†



Cypræa Moneta.

HENRIETTA.

The colors of some of these species are beautiful, and the regularity of their spots is most wonderful.

* Lindley.

† Mrs. Lee, in her interesting "Stories of Strange Lands."

ESTHER.

The skin is full of pores; these contain the coloring fluid, which penetrates the calcareous substance before it is hardened, and forms its diversified tints. These pores are arranged over the skin of mollusca with the same undeviating regularity as the spots of the leopard or the stripes of the tiger, and as the liquor exudes and stains the shell, the uniformity of the pattern is, in consequence, in the order in which the pores are placed in the mantle.

HENRIETTA.

Here are all the whelks (*Buccinum*).

ESTHER.

The horn of the tritons is represented as one of these shells. Here is the beautiful *Haliotis*, or Venus' ear, the animal of which is eaten in some places. Look at this row of holes, or perforations, at its margin; each period of the shell's increase is marked by a new hole; and when a fresh one is opened, one towards the spire is closed, and in it the animal places its siphon. Seven to eight apertures appear to be the number which the animal keeps open at a time.

FREDERICK.

This is the violet snail (*Helix Janthina*), which aunt mentioned when talking about the shells which produce purple.*

ESTHER.

Yes; this little fragile shell is found in almost every sea, both tropical and temperate. It dwells in the stormy ocean, sometimes a thousand miles from land, and offering no resistance to its fury, rides upon the waves in perfect safety. It is always found floating on the water, and probably never visits the bottom, or willingly approaches the shore. Supported by means of a small cluster of bubbles, composed of transparent vesicles, which it inflates with air at pleasure, this "common oceanic snail" floats upon the ocean, and not only disperses itself universally, but is also the means of

* Chap. XI.

disseminating other species, which either attach themselves or their eggs, to its shell.* Mamma was telling us the other day, you remember, about the hybernation of the garden snail.† It would appear that other testaceous mollusca have the power of suspending animation, and retaining life, for a long period, without air or nourishment. Mr Lyell relates that four specimens of a large species of *Bulimus* were brought to England from the straits of Magellan. They had been packed up in a box, and enveloped in cotton, two for a space of thirteen, one for seventeen, and a fourth for upwards of twenty months; but, on being exposed to the warmth of a fire, and provided with tepid water and leaves, they revived, and are now living in Mr. Loddidge's palm-house.

HENRIETTA.

This is the common periwinkle.

ESTHER.

It is. The Swedish peasants affirm that when these animals (*Turbo littorius*) ascend the rocks, it is a sure sign of a storm, as, prompted by instinct, they place themselves out of the reach of the dashing of the waves; and when they again descend upon the sand, it is a sign of a calm.

HENRIETTA.

And what is this large shell?

ESTHER.

It is the *Strombus gigas*, with which, I have understood, that the streets of Christianstadt and of Santa Cruz are paved. The beautiful shell cameos which are carved in Italy are sculptured from the *Strombus*; and the Italians procure the greater part of these shells from England, to which country they are brought from the South Seas.

HENRIETTA.

What is this shell, which looks so much like a ram's horn, only it is longer?

* Lyell.

† Chap. XII.

ESTHER.

It is the *Nautilus spirula*. Those specimens which you have generally seen have probably been broken; it being usually, from its great fragility, found imperfect. In its complete state it more resembles a crozier. This is the *Nautilus (N. pompilius)* of which mamma has an ornament on the chimney-piece. It is found in abundance at Manilla, where the colored part of the shell is removed, and raised white carved figures embossed upon it, and then two shells being fastened together, the one aperture turned downwards, the other upwards, it forms a graceful mother-o'-pearl cup or chalice.

HENRIETTA.

Is mother-o'-pearl the same composition as pearls?

ESTHER.

Precisely; there is no difference whatever. Shells have been divided into two classes; porcellaneous and mother-o'-pearl. The texture of the first is brittle, and resembling porcelain; their surface is smooth and they are often beautifully variegated. They are composed of carbonate of lime united to a very small portion of gelatine. Most of the univalve shells, such as whelks, limpets, cowries, &c. belong to this class.

HENRIETTA.

And the second class, or mother-o'-pearl?

ESTHER.

These are mostly bivalves, the oyster and mussel belong to it. In both classes, the hardening principle is carbonate of lime; but in the mother-o'-pearl it is united with albumen, but in larger quantities than the animal matter (gelatine) exists in the porcellaneous shells.*

HENRIETTA.

But here, Esther, is a little mussel, which I suppose, by mistake, is placed among the univalves.

* Brande's Chemistry.

ESTHER.

True. I only received it the other day, and have not put it in its place. It is the species of mussel (*Mytilus lithophagus*) which is found at Pozzuoli, near Naples, in the temple of Serapis. The marble columns, at the height of twelve feet, are pierced by this perforating bivalve. The holes of these animals are pear-shaped, the external opening being minute, and gradually increasing downwards. These perforations are so considerable in depth and size that they manifest a long continued abode of these animals in the columns, for as they grow older and increase in size, they bore a larger cavity, to correspond with the increasing magnitude of their shell.—The granite columns of the same temple remain untouched.

HENRIETTA.

How is this accounted for?

ESTHER.

We cannot but infer that these columns must have been, for a long period, immersed in salt water, in an erect position, and, after remaining for so many years submerged, must have been upraised to the height of about twenty-three feet above the level of the sea; but by what internal convulsions these two changes must have been affected, is unknown. These effects occur in other instances in the Bay of Naples, and the whole country about, which is volcanic; and not far from Pozzuoli, is the Monte Nuovo, which was raised in 1538 by one of those internal convulsions; but you will find full accounts of the volcanic eruptions in the district about Naples in Mr. Lyell's interesting work on geology. The mention of these stone-boring mussels bring us to the last drawer of the cabinet, which contains the *Tubicolæ*, among which the ship-borer (*Teredo navalis*) stands pre-eminent.

HENRIETTA.

Are not these the animals which do so much mischief to ships?

ESTHER.

They are. This animal is a native of the equatorial seas; but, by adhering to the bottom of ships, it has been transported to Holland, where, independent of the injury it causes among the ships, it has been most destructive to the piles of the dykes, by which it has more than once threatened that country with destruction. Commerce has naturalised this animal in England, and you must have often seen old ship timber covered with its perforations. As they grow larger they bury themselves deeper, and line their passage to the opening, with a kind of calcareous crust which exudes from them, and forms a sort of tubulous shell. Here is one of them. The pinna, chama, and other large shells I keep in this lower drawer; but mamma has already given us a full account of most of them in one of our former conversations.*

HENRIETTA.

This drawer is full of sponges.

ESTHER.

Yes; I am beginning a collection of sponges and corals, but as yet it is very small.

HENRIETTA.

Where does the common sponge come from?

ESTHER.

The fishery for them is chiefly carried on in the Mediterranean, particularly in the Grecian Archipelago. The finer sponges come from Constantinople; the larger from the vicinity of Tunis and Algiers. The collecting of them is attended with danger, as they are fixed to the rocks at the depth of several fathoms, so that the sponge fishers must be excellent divers. The ancients, who did not cover their tables with linen cloths, used to clean them with sponges; as they did their hands, after their meals, with pieces of bread, which they afterwards threw to the dogs, as we learn from Homer, and

* Chapter XI.

which also clearly explains the force of the beautiful address of the woman of Canaan to our Saviour.*

HENRIETTA.

Does not iodine exist in sponge?

ESTHER.

Yes, in considerable quantities. You recollect mamma's allusion to it, when we were talking about seaweeds.† But I hear Frederick calling us; so we must go and put on our bonnets, as it is just the hour for walking.

* Matthew, xv. 27

† Chapter V.

CHAPTER XVIII.

THE WHALE FISHERY.

PORTUGUESE MAN OF WAR.—PALATE OF THE WHALE.—BILL OF THE DUCK.—SPERMACETI.—AMBERGRIS.—WHALE FISHERY.—VILLAGE OF SMEERENBERG.—DECLINE OF THE WHALE FISHERY.

There leviathan,
 Hugest of living creatures, on the deep
 Stretched like a promontory sleeps or swims,
 And seems a moving land; and at his gills
 Draws in, and at his trunk spouts out, a sea.

PARADISE LOST.

HENRIETTA.

AUNT, I was reading some voyages this morning, in which the author frequently mentions seeing the "Portuguese man of war" floating about on the surface of the ocean. What kind of animal is it?

MRS. F.

It is one of the Zoophytes (*Physalia* genus), and is rendered remarkable by the beautiful appearance which it presents when, in calm weather, it is seen swimming on the water suspended by a little oblong bladder filled with air, surmounted by a rising crest, which it employs as a sail. This inflated or bladder portion of the animal glows with the most delicate crimson tints, and floats upon the waves, whilst its long tentacula, of a deep purple color, extend beneath, as snares to capture its prey.

HENRIETTA.

Where is it found?

MRS. F.

It inhabits the tropical seas, but, during the summer months of the year, it is found in higher latitudes. Its colors are as evanescent as they are beautiful, and the bright crimson, green, and purple tints, speedily lose their brilliancy when the animal is taken out of the water.

ESTHER.

I have understood that their appearance near the sea coast is considered as an indication of an approaching tempest.

MRS. F.

It is. But I have not yet mentioned its stinging properties. Mr. Bennet, the intelligent traveller in New South Wales, tells us that it is amusing to see the eagerness with which persons endeavor to secure the gaudy prize; but they soon find, by experience, the rashness of the chase, for no sooner do they grasp the curious animal, than, encircling its long filiform appendages over the hands and fingers of its capturer, it inflicts such pungent pain, by means of an acrid fluid which it discharges from its tentacula, as to cause him to drop his prize.

ESTHER.

Is the sting, then, so very severe?

MRS. F.

Yes; but the intensity of the effects depend, of course, upon the size of the animal; and, after it has been long out of water, its power is diminished. Doubtless this property has been given to these little animals, by that Gracious Being whose "tender mercies are over all his works," to serve both as an instrument of defence, and also as a means of procuring and benumbing their prey.

ESTHER.

The French call them *Galères*, and the old navigators

"Guinea ships," probably from having first observed them on that coast.

MRS. F.

But the *Physalia* and the *Nautilus* are not the only mollusca which thus float upon the surface of the ocean. The little *Clio helicina*, which, with another of its species (*C. borealis*) form one of the aliments of the whale, sails in the northern seas, where it abounds.

HENRIETTA.

What is it that the whale chiefly feeds upon?

MRS. F.

Upon small fish, worms, mollusca, and zoophytes.

FREDERICK.

But what small food for so enormous an animal!

MRS. F.

The construction of the mouth of the whale is admirably adapted for taking the food upon which it subsists. The upper jaw is, as you know, lined with the substance which we call whalebone, the edges of which are furnished with long hairs, or filaments. The whale swims with great velocity, and with its mouth wide open, by which means an immense volume of water, and consequently quantities of the mollusca it contains, enter its mouth. The water is spouted up in the air by means of a narrow opening pierced just above the head, while the food remains entangled in the hairy palate.

HENRIETTA.

What a beautiful arrangement! I have heard people who saw the skeleton of the whale in London, observe how very small its swallow is for so large an animal; but its food, consisting chiefly of these little mollusca, accounts for it.

MRS. F.

Yes; the *clio*, of which I was telling you, is hardly an inch long.

ESTHER.

Then these whalebones appear to answer much the same purpose to the whale as the serrated or toothed bill does to the duck.

FREDERICK.

What is that?

ESTHER.

Ducks, and, I believe, most birds which live by suction, have the inside of their heads, towards the edge, thickly set with rows of short, strong, sharp-pointed prickles. These form a kind of filter; the liquid substances into which the duck plunges her bill she draws, by the action of her lungs, through the narrow interstices which lie between these teeth, catching, as the stream passes across her beak, whatever it may happen to bring along with it that proves agreeable to her choice, and easily dismissing the rest.*

HENRIETTA.

Are there many whalebones in the mouth of a whale?

MRS. F.

The number varies from eight to nine hundred. I saw the skeleton of the whale to which Henrietta alludes, and that had eight hundred. This whale is supposed to have died of old age, for the cartilages of the fingers of its fins were quite ossified.

HENRIETTA.

Then how long is a whale supposed to live?

MRS. F.

A thousand years, according to the estimation of Buffon and Lacépède; and I have understood that Cuvier assigned from nine hundred to a thousand to the one in question. It is calculated that a pair of whales may live to count not less than 72,000,000,000 of their offspring.

* Paley.

FREDERICK.

What is the usual length of the whale?

MRS. F.

The skeleton which I saw was ninety-five feet long, but travellers assert that they have met with whales of an incredible length.* However, these accounts rest upon no authentic foundation, and recent observations† make it appear that the common whale (*Balæna mysticetus*) seldom exceeds seventy feet in length; the skeleton, therefore, exhibited is unusually large.

ESTHER.

But is the common, or Greenland whale, the largest of the genus?

MRS. F.

No; though long considered as such, it must yield the pre-eminence to the Rorqual (*Balæna boops*), which is found much larger, but is seldom taken, for it affords little oil, and is very ferocious and dangerous to catch, in consequence of the violence of its movements when attacked

MARY.

How large the head of the whale is!

MRS. F.

Yes; its head occupies a third, or even half, of the whole length of its body. It is, you know, in the head of one genus (*Physceter*) that spermaceti is found.

ESTHER.

And does not ambergris also come from the spermaceti whale?

MRS. F.

So it is supposed. This substance is usually found in opaque solid lumps, floating upon the sea, and appears to be a

* 300 feet.

† Scoresby.

concretion formed in the Cachalot, or spermaceti whale. Ambergris is highly esteemed among the eastern nations, and sells for an enormous price.

ESTHER.

Of what size are the lumps generally?

MRS. F.

They have been met with of an immense size. In 1755, the French East India Company had a lump weighing 62 kilogrammes* (about 132lbs. 13 oz.), and the Dutch East India Company gave 11,000 rix dollars (about 2,383*l.* 6*s.* 8*d.*) for a piece weighing 91 kilogrammes (194 lbs. 14 oz.).

ESTHER.

Is not the tail of the whale its most powerful weapon?

MRS. F.

It is; and indeed the whale has occasion for instruments of defence, for it has many enemies to encounter. Its skin is covered with barnacles (*Balanus* genus) and other parasites, which cause flocks of petrels (*Procellaria pelagica*) and other sea birds to perch upon its back, in order to devour them; but its three great enemies in the ocean are, the sword-fish (*Xiphias gladius*), the common shark (*Squalus carcharius*), and the grampus† (*Delphinus gladiator* and *orca*). The sword-fish attacks the whale with its terrible weapon, and the grampus assail it in large troops, teasing it till it opens its mouth, and then they devour its tongue.

FREDERICK.

How very savage.

MRS. F.

The whale may be placed at the head of the animal kingdom, for to no other animal has Providence assigned so

* A kilogramme equals 2 lbs. 2 oz. 4 drs. 16 grs. English weight; a rix dollar equals 4*s.* 4*d.* sterling.

† Grampus, *i. e.* grand poisson.

extensive a range. Time may be said to belong to it as well as space; its life is centuries; a thousand years the term of its existence.* In swiftness of motion it surpasses even the trade winds; the latter only move at the rate of rather more than thirty-five feet a second; the whale, considerably faster. Supposing a whale were to take twelve hours rest a day, it would go round the globe at the equator in forty-seven days, and would be only twenty-four days going from pole to pole. And then its size—in which it bears the same proportion to the marine animals, as the elephant, the rhinoceros, and the hippopotamus, do to terrestrial. No animal is more powerful, none has such universal empire.†

ESTHER.

Would you have the kindness, mamma, to give us some account of the whale fishery?

MRS. F.

With pleasure; I will give you an abstract of some notes which I have made upon the subject.

HENRIETTA.

Thank you, aunt.

MRS. F.

Though the Norwegians may have occasionally captured the whale before any other European nation engaged in so perilous an enterprise, the Biscayans are certainly the first people who prosecuted the whale fishery as a regular commercial pursuit.‡ They carried it on with great vigor and success during the twelfth, thirteenth, and fourteenth centuries; and whales' tongues at that time were esteemed as an article of food, and the whalebone also brought a very large price.

* Lacedpede.

† Lacedpede, Buffon, and Diet. des Sciences Naturelles.

‡ The following is taken from M. Jonkaire's work on the Whale Fishery, as quoted in the 14th number of the Foreign Quarterly Review.

ESTHER.

Why did this fishery cease?

MRS. F.

From the same cause that has occasioned the cessation of the whale fishery in many other places, namely, the want of fish. Whether the whales, from a sense of the danger to which they exposed themselves in coming southwards, no longer left the icy sea, or that the race had nearly been destroyed, we cannot determine, but it is certain that they gradually became less numerous in the Bay of Biscay, and, at length, ceased almost entirely to frequent that sea; and the fishermen being obliged to pursue their prey upon the banks of Newfoundland and the coasts of Iceland, the French fishery rapidly fell off. The voyages of the Dutch and English to the northern ocean, in order to discover a passage to India, though they failed in their main object, laid open the haunts of the whale. The companions of Barentz, who discovered Spitzbergen (in 1596), and of Hudson, who soon afterwards explored the same seas, represented to their countrymen the amazing number of whales with which they were crowded, and vessels were, in consequence, fitted out by each nation, the harpooners and crew being Biscayans. The Muscovy Company strove to monopolise the exclusive right of fishing in the seas round Spitzbergen, but the attempt was not tolerated. After several encounters between them and the Dutch, the conviction became general, that there was room enough for all parties in the northern seas, and, in order to avoid the chance of coming into collision again, they parcelled Spitzbergen and the adjacent ocean into districts, which they respectively assigned to the different European nations; and the Dutch soon acquired a decided superiority over all their competitors.

ESTHER.

Were the whales very plentiful?

MRS. F.

When the Europeans first began to prosecute the fishery on the west of Spitzbergen, whales were found every where in great numbers; and, ignorant of the strength and stratagems of the formidable foe who assailed them, instead of betraying any symptoms of fear, the whales surrounded the ships and crowded all the bays. Their capture was, in consequence, a comparatively easy task, and many were killed which it was afterwards found necessary to abandon, from the ships being already full.

HENRIETTA.

I suppose that a vessel cannot contain many of these huge animals.

MRS. F.

In the returns of the fishery, I do not see that they ever bring home above eight or ten; but whether a vessel would hold more I cannot say. However, at the period of which I am speaking, the whales being thus easily obtained, it was the practice to bring home only the oil and the whalebone, and to boil the blubber on shore in the north. Perhaps, nothing can give a more vivid idea of the extent and importance of the Dutch fishery in the middle of the seventeenth century, than the fact that they constructed a considerable village, the houses of which were all previously prepared in Holland, on the isle of Amsterdam, to which they gave the appropriate name of *Smeerenberg*.

ESTHER.

What is the derivation of the name?

MRS. F.

From *smeeren* to melt, and *berg*, a mountain. This village was the grand rendezvous of the Dutch whale ships, and was amply provided with boilers, tanks, and every sort of apparatus required for preparing the oil and the bone. Nor was this all; the whale ships were attended by a number of pro-

vision ships, the cargoes of which were landed at Smeerenberg, which abounded, during the busy season, with well-furnished shops, good wines, &c., so that many of the conveniences and enjoyments of Amsterdam were found within about eleven degrees of the Pole.

ESTHER.

Yes; it is thought worthy of particular mention that the sailors and others were supplied with what a Dutchman regards as a great luxury — hot rolls for breakfast.

MRS. F.

Batavia and Smeerenberg were founded nearly at the same period, and it was for a considerable time doubted whether the latter was not the more important establishment of the two.

ESTHER.

What was the cause of its decline?

MRS. F.

The same which had destroyed the fishery of the Biscayans, namely, the absence of fish; whales gradually became less common and more difficult to catch. They retreated first to the open seas, and then to the great banks of ice on the eastern coast of Greenland. When the site of the fishery had thus been removed to a very great distance from Spitzbergen, it was found to be the more economical plan to send the blubber to Holland; Smeerenberg was in consequence totally deserted, and its position is now with difficulty discovered.

ESTHER.

Is the Dutch fishery at present of any extent?

MRS. F.

No; it was entirely ruined by the war, and all attempts to revive it have proved ineffectual; the Dutch having, during

the twenty years they were excluded from the sea, lost all that practical acquaintance with the details of the fishery, for which they had long been so famous, and which is so essential to its success.

ESTHER.

What other nations have entered into the whale fishery?

MRS. F.

Hamburg, Altona, and other parts of the Elbe, carry it on with success; France, though it preceded, originally, all other nations in the trade, can hardly be said, for many years, to have had a share in it. The revolutionary war destroyed every vestige of the rising trade which Louis XVI had endeavored to foster. But the French Government offer now such immense bounties, that probably this branch of commerce may soon be revived among them.

ESTHER.

Who, then, are now the principal nations engaged in the trade?

MRS. F.

The English and the Americans. The occupation of Holland by the French, and the consequent hostilities in which she became involved with this country, contributed more than any thing to the promotion of the British fishery. Our government wisely offered to the fishers of Holland all the privileges enjoyed by the citizens of Great Britain, in the event of their settling among us. Many availed themselves of this encouragement, and bringing with them their capital, their industry, and their skill, prosecuted the fishery with the greatest success; but the uncertainty of finding fish, and the risk of shipwrecks,* have rendered the trade more of

* In 1830, out of 87 ships that sailed to Davis's Straits, 18 were lost, 24 returned empty, and, of the remainder, not one had a full cargo.

the nature of a speculation than of a regular, industrious pursuit.

ESTHER.

Are not high bounties given to the whale ships?

MRS. F.

They were formerly. At one time,* as high as forty shillings a ton was given; but, in 1824, these bounties were entirely abolished, and so great was the expense of keeping it up, that the whale fishery, as a source of national wealth, may now be considered as of little importance. Olive, rape, and linseed oil, and, for many purposes, even tallow might be substituted for whale oil; if, therefore, the fishery should decline even still more, its loss will probably be of little injury to the country. I have already mentioned that the whales are continually changing their haunts. The seas between Spitzbergen and Greenland are now abandoned, and the whales resort to Davis's Straits and Baffin's Bay, or to the sea on the coast of West Greenland. The various discoveries of our Northern navigators have made us acquainted with new and advantageous situations for the fishery; but it has undergone so many revolutions that it probably will again be necessary, in a few years, to follow the whale into new and more inaccessible haunts.

ESTHER.

Mamma, you have not alluded to the South Sea fishery.

MRS. F.

That was not prosecuted by the English until about the beginning of the American war, and it had previously been entered into by the Americans, who, for a lengthened period, have carried on the whale fishery with greater vigor and success than perhaps any other people. For half a century after its commencement, they found an ample supply of fish on their own shores, but the whales having abandoned them, the

* In 1749.

American navigators entered with extraordinary zeal into the fisheries carried on in the Northern and Southern oceans, and no nation has ever carried this perilous mode of hardy industry to the extent to which it has been pursued by them.

CHAPTER XIX.

VEGETABLE PHYSIOLOGY.

WATCH OF FLORA.—ANTIPATHIES.—SMELL OF FLOWERS.—FLOWERS
IN A ROOM.—LEAVES.—NECESSITY OF ALTERNATION OF LIGHT
AND DARKNESS TO PLANTS.—ACIDITY OF FRUITS.—STARCH.—
BRAZIL NUTS.—GENIPA.—CANNON-BALL TREE.—CALABASH.—IN-
FLAMMABLE PLANTS.—FRAXINELLA AND LYCOPODIUM.—DOODOE
NUTS.—STORMY PETREL.—GUACHARO.—BOG FIR AND OAK.—
PAPER FROM PEAT.—CÆSALPINIA PLUVIOSA.—CORYANTHES MACU-
LATA.—SHAGREEN.—FRAGRANCE OF FLOWERS AFTER RAIN.

What are flowers? perfect things
Breathing in unwholesome air;
Left to aid Hope's weary wings
To soar above the clouds of care.

FLORA'S OFFERING.

MRS. F.

HERE is that table which I once promised to show you, giving the hours of expansion and closing of different flowers; or, as it is usually termed, a dial or watch of Flora. It may amuse you to verify its correctness by your own observations. But I should tell you that the hours given are those which are recorded by Linnæus for Upsal, and by De Candolle for Paris; they will therefore not exactly agree with the time here. Most of the flowers selected are common, either wild or in our gardens.

ESTHER.

In what manner, then, does climate influence the opening and shutting of flowers?

MRS. F.

In proportion as the climate is colder, the expansion takes place the later. Thus, a plant which would open at six o'clock in the morning at Senegal, would only expand at eight or nine in France, and at ten in Sweden; so that the expansion is calculated to be an hour later for every ten degrees of latitude. Heat and light would therefore appear to be the chief agents in the opening and closing of flowers; but that they are not the only ones is evident, from some flowers opening only at night, and others being also subjected to atmospheric influence.

ESTHER.

Such as the little scarlet pimpernel (*Anagallis arvensis*), or the convolvuli, which close when it is going to rain.

MRS. F.

Or the Virginian sow thistle, which if it shuts its flowers in the evening, we may be sure of a fine day; and if it opens them, we may prognosticate that the next morning will be rainy. Indeed, a number of flowers might be enumerated which offer parallel hygroscopic phenomena; and if they were collected, we might form a barometer, as well as a watch, of Flora, but here is the Table which I promised to show you:

WATCH OF FLORA.

Hour of shutting at Upsal.		NAME OF THE PLANT.	Hour of opening at Upsal. Paris.	
A. M.	P. M.		A. M.	A. M.
9-10	3	Convolvulus nil (the large annual species)	-	3-4
		Convolvulus sepium (common white bind-weed)	-	3-4
		Tragopogon pratense (goat's beard)	3-5	4-5
		Matricaria suaveolens	-	4-5
		Leontodon tuberosum	-	4-5
10		Picris hieracioides	-	4-5
		Cichorium intybus (wild endive)	-	4-5
		Other Cichoraceous plants	-	4-5
10-12		Crepis tectorum	-	4-5
10		Picridium tingitanum	-	4-6

Hour of Shutting at Upsal.		NAME OF THE PLANT.	Hour of Opening at Upsal. Paris.	
A. M.	P. M.		A. M.	A. M.
11-12		<i>Sonchus oleraceus</i> - - -	5	
	7	<i>Papaver nudicaule</i> - - -	5	5
	7-8	<i>Hemerocallis fulva</i> - - -	5	
		Moist <i>Cichoraceæ</i> - - -		5
		<i>Momordica elaterium</i> - - -		5-6
		<i>Lapsana communis</i> , and many <i>cichoraceous</i> plants - - -	5-6	5-6
		<i>Convolvulus tricolor</i> - - -		5-6
8-9		<i>Leontodon taraxacum</i> (dandelion) - - -	5-6	
	11	<i>Crepis alpina</i> - - -	5-6	
	10	<i>Rhagadiolus edulis</i> - - -	5-6	
	4-5	<i>Hypochaeris maculata</i> - - -	6	6
	5	<i>Hieracium umbellatum</i> - - -	6	
		<i>Solanum</i> , several species - - -		6
		<i>Convolvulus siculus</i> - - -		6
		<i>Sonchus</i> (sow thistle), several species - - -	6-7	6-7
		<i>Hieracium</i> (hawkweed), several species - - -	6-7	6-7
	2	<i>Hieracium murorum</i> - - -	6-7	
	3-4	<i>Hieracium pilosella</i> - - -	6-7	
	1-2	<i>Crepis rubra</i> - - -	6-7	
10-12		<i>Sonchus arvensis</i> - - -	6-7	
	4	<i>Alyssum utriculatum</i> - - -	6-8	
	3	<i>Leontodon hastile</i> - - -	7	
		<i>Sonchus lapponicus</i> - - -	7	
		<i>Lactuca sativa</i> - - -	7	7
	3-4	<i>Calendula pluvialis</i> (small Cape mary-gold) - - -	7	7-8
	5	<i>Nymphaea alba</i> (white water) - - -	7	7
		<i>Nuphar</i> (yellow ditto) - - -	7	7
	3-4	<i>Anthericum ramosum</i> - - -	7	
		<i>Camelina sativa</i> - - -		7
		<i>Prenanthes muralis</i> - - -		7
	2	<i>Mesembryanthemum barbatum</i> - - -	7-8	7-8
	3	<i>Mesembryanthemum linguiforme</i> - - -	7-8	
		<i>Campanula speculum</i> (Venus' looking-glass) - - -		7-8
		<i>Cucumis anguria</i> (prickly cucumber) - - -		7-8
	2	<i>Hieracium auricula</i> - - -	8	
		<i>Anagallis arvensis</i> - - -	8	8
	1	<i>Dianthus prolifer</i> - - -	8	
		<i>Nolana prostrata</i> - - -		8-9
	1	<i>Hieracium chondrilloides</i> - - -	9	
12	3	<i>Calendula arvensis</i> - - -	9	
	2-3	<i>Arenaria rubra</i> - - -	9-10	
	3-4	<i>Mesembryanthemum crystallinum</i> (Ice-plant) - - -	9-10	9-10
	3	<i>Mesembryanthemum nodiflorum</i> - - -	10-11	10-11
		<i>Portulaca sativa</i> (purslane) - - -		11
		<i>Ornithogalum umbellatum</i> (called on that account "Dame d'onze heures") - - -		11

Hour of Shutting at Upsal.		NAME OF THE PLANT.	Hour of Opening at Upsal.		Paris.
A. M.	P. M.		P. M.	A. M.	
		<i>Tigrida pavonia</i> - - -		11	
		Most Ficoideous plants - - -		12	
				P. M.	
		<i>Scilla pomeridiana</i> - - -		2	
		<i>Mirabilis jalapa</i> (marvel of Peru) - - -	5	6—7	
		<i>Pelargonium triste</i> - - -	6		
		<i>Mesembryanthemum noctiflorum</i> - - -		7—8	
		<i>Oenothera tetraptera</i> - - -		7—8	
		<i>Oenothera suaveolens</i> - - -		7—8	
	12	<i>Cereus grandiflorus</i> (night-blowing Ce- reus) - - -	9-10	7—8	
		<i>Silene noctiflora</i> - - -	9-10	5—6	
		<i>Convolvulus purpureus</i> - - -		10	

HENRIETTA.

Thank you, aunt. I should like to copy this table, if you will allow me. But, talking of flowers, why is it that you told me not to carry the tuberose up into my room?

MRS. F.

Because the scent is so powerful as to be insupportable to many persons of weak nerves. Indeed the spasmodic affections produced by the odors of flowers, are more common than is generally supposed, but vary, of course, according to the constitution of the individual.

ESTHER.

Mary de Medicis could not bear the sight of a rose, even in painting; and Cardinal de Guise would faint away at the sight of the same flower.

MRS. F.

But these were natural antipathies, such as that of Boyle to a spider; for in these instances, the mere sight of the rose, without smelling it, appears to have been sufficient to disturb the tranquillity of the individual; but I am at present alluding to the effect of vegetable odors upon the senses. Few can bear the fragrance of the lilac or jonquil, especially in a room; and even violets, the last flowers to be suspected,

have in many cases, proved deleterious; De Candolle says he has witnessed many ladies faint from carrying too many of them on their persons, or from having placed them too near them when asleep. It is asserted that people have died from being shut up in a room in which the oleander was in flower; hysterics have been brought on by the musk mallow; saffron has been known to produce swooning, and the flowers of *Lobelia longiflora* have caused suffocation.*

ESTHER.

And some trees are equally hurtful; the elder, the walnut, and the anagryis, bring on headache in persons who sleep beneath their shade; and the Manchineel tree is said to have proved fatal to travellers who have trusted to its shelter.

MRS. F.

I believe that the idea that plants vitiate the air of a room at night, because at that time they part with carbonic acid and inhale oxygen, is much exaggerated. If it is vitiated at all, it is by their powerful odors, which, as I have just shown you, act upon the nerves of many persons.†

ESTHER.

But they give out carbonic acid at night, do they not?

MRS. F.

Yes; but a single human being will vitiate the air more than a hundred plants. However, the strong smell of flowers is sufficient reason for banishing them from a sleeping apartment. But it has been ascertained that the slight diminution of oxygen, and increase of carbonic acid, which takes place during the night, bears no considerable proportion to the degree in which the contrary effect is observable during the day; and therefore the immense quantity of vegetables which cover the globe are constantly increasing the quantities of atmospheric oxygen which is diminishing by the breathing of animals, and so contribute to render again fit for inspiration, the air

* Lindley.

† Lindley.

which has been vitiated. Thus Providence provides a living check upon *malaria*, and has admirably ordained that one of the kingdoms of nature should render and maintain the world in such a state as to be habitable by the other.

ESTHER.

Leaves perform important functions to plants.

MRS. F.

Yes; they are at once the organs of respiration, digestion, and nutrition.

HENRIETTA.

Then why do gardeners so often take them off the fruit trees?

MRS. F.

From the greatest ignorance. If a branch be stripped of its leaves for a whole summer, it will either die or not increase in size perceptibly. Deprive a tree of its leaves, and the flowers lose their color; and if it be before the fruit has commenced ripening, the fruit will fall off and not ripen; or if in a more advanced stage, it will diminish its flavor considerably. This, therefore, is one of the numerous examples of the benefit which is daily accruing to horticulture from the knowledge of vegetable physiology.

ESTHER.

Do plants grow most by night, or by day?

MRS. F.

They grow chiefly by day, as appears from the few observations which have been made upon the subject. Wheat and barley were found to grow by day nearly twice as fast as by night; but the diurnal changes of day and night are as necessary to the well-being of plants as they are to that of animated beings. If plants were kept incessantly growing in light, they would be perpetually decomposing carbonic acid, and would in consequence, become so stunted that there could be no such thing

as a tree, as it is actually the case in the polar regions, where one long day and night comprise the year. If on the other hand, they grow in constant darkness, their tissue becomes excessively lengthened and weak; no decomposition of carbonic acid takes place; none of the other parts acquire solidity and vigor; and finally, they perish. But under the beautiful arrangement of Providence, plants which in the day become exhausted by the decomposition of carbonic acid, and by evaporation, repair their strength at night, by inhaling oxygen copiously, and so forming a new supply of carbonic acid, by absorbing moisture from the earth and air without losing any portion of it.*

ESTHER.

I suppose that the reason that fruits are more acid in the morning than in the evening† is, that in the sun's rays, they decompose their carbonic acid, and part with their oxygen, of which they do not gain a fresh supply until night.

MRS. F.

It is so. Botanists have also found that leaves which are acid in the morning, and will turn litmus paper‡ red, produce no effect upon it by noon, and are then tasteless. Starch, again, in which carbon forms so large a proportion, and which in the potato, cassada, corn, beans, peas, &c., contributes so largely to the nourishment of man, depends for its abundance essentially upon the presence of light. It also increases the saccharine matter in the sugar-cane, and completes the formation of oil in the seeds of oleaginous plants.

ESTHER.

Mr. Knight, the President of the Horticultural Society, has turned this known fact to great account in the cultivation of potatoes. He leaves wide intervals between his rows, and makes them lie from north to south, so as to expose as large

* Lindley.

† Ibid.

‡ See Chapter XI.

a surface as possible to the light.* Potatoes grown in orchards are watery, in consequence of the leaves and branches of the trees intercepting the light; the quantity of nutrition they contain being in direct proportion to the quantity of light which they receive.

MRS. F.

Starch is a common secretion among vegetables; besides the plants already alluded to, we find it in the tubers of the Jerusalem artichoke; in fleshy roots, as in the the briony; in the centre of the stems, as in the sago palm; in the receptacles of plants, as in the artichokes; in the liber of some trees, as the pine and the birch; and in the rind of certain fruits, as the date, the bread-fruit, &c.

ESTHER.

Did you ever, Henrietta, see those triangular nuts in the shops which are called Brazil nuts?

HENRIETTA.

Yes, often, and have wondered what they were.

ESTHER.

They are the fruit of a large tree, of from a hundred to a hundred and twenty feet in height, and with a trunk from two to three feet in diameter. It is called the Juvia or Almen-dron. Its botanical name is *Bertholletia excelsa*, and it belongs to the natural order of *Myrtaceæ*. It does not flower until its fifteenth year, and its leaves are two feet long. The seeds, which are sold in England and Portugal, under the name of Brazil nuts, form a principal article of commerce with the natives of the Esmeralda, the Orinoco, and the Amazon. There are generally from fifteen to two-and-twenty nuts enclosed in a shell or pericarp, which is less than fifty or sixty days in forming, and of which the woody part, nevertheless, is so hard that though only half an inch in thickness, it is with difficulty that it can be sawn asunder.

* Hints on Vegetation by Sir John Sinclair.



Brazil Nuts.

MRS. F.

It has been already observed by an eminent naturalist,* that the wood of fruits generally attains a degree of hardness not to be met with in the wood of the trunk of trees;—but I interrupt you.

ESTHER.

This pericarp is spherical, and from twelve to thirteen inches in diameter. The weight of these fruits is so enormous that one traveller asserts, that the natives dare not venture into the forests without covering their head and shoulders with a shield of very hard wood. De Humboldt says that these shields were not known on the Esmeralda, where he saw the trees, but that the natives spoke of the danger which they incurred when these fruits, which are of the size of a child's head, began to ripen, and fell from a height of fifty or sixty feet to the ground, when they make an enormous noise by their fall. The nuts detach themselves in time, and move freely within their shell, and the rattling noise they then make when dropping from the tree, excites the greediness of the Capuchin monkies (*Simia chiropotes*), who are singularly fond of the Brazil nuts.†

* Richard.

† Humboldt, Voyages, t. viii.

MRS. F.

That is like the *Genipa*, the fruit of which in its fall is said to crack upon the ground with the report of a pistol, and to give notice to the land crabs, who immediately hasten to the tree to seek a repast — one of those innumerable modes by which Providence attracts the animal to the food upon which it is destined to live, and gives, in endless variety, “the means proportioned to the end.”

ESTHER.

There is also the Cannon-ball tree, (*Couroupita Guianensis*) belonging to the same order as the Brazil nut, which grows in the dense forests of Cayenne, and the fruit makes a similar noise in falling, whence the tree derives, in some measure, its name. But it also has procured this appellation from the fallen pericarp, or fruit, which strew the ground, exhibiting the scar or hole by which they were attached to the stalk, and which so closely resemble the cannon shell, that one might easily, at first sight, imagine that a company of artillery had bivouacked in its shade.

HENRIETTA.

Is the tree large?

ESTHER.

It is from fifty to sixty feet high, and covered with a profusion of brilliant scarlet flowers, which are highly fragrant. The fruit are round, and from four to eight inches in diameter; when cut and ripe they diffuse a most intolerable odor, but, in a less mature state, the pulp is employed to afford a refreshing drink in fevers. The shell is used in South America for the same purpose as the Calabash (*Oreocentia cufete*.)*

MRS. F.

The shell of the Calabash sometimes constitutes the sole article of furniture of the Carib Indians. By ligatures

* Hooker, Botanical Magazine.

applied to the fruit while it is still growing, it is made to assume a variety of forms, to adapt it to the various purposes for which they use it. They often carve, polish, and stain it, and their goblets, water cans, and even their kettles to boil water, are made from it; the hard woody shell being so thin, and close-grained, as to stand fire several times before it is destroyed.

HENRIETTA.

Aunt, I heard the other day, that the flowers of the *Nasturtium* give out sparks in the evening.

MRS. F.

We are told by Linnæus that his daughter observed this phenomenon in the common *Nasturtium* (*Tropæolum majus*), but the *Fraxinella* (*Dictamnus Fraxinella*) is the most curious instance of this exhalation of inflammable vapor from plants. Its leaves and stem are covered with little brown resinous glands, emitting a powerful balsamic odor. This plant, in warm weather, is surrounded by an inflammable atmosphere, formed by its own vapor, which will take fire when a light is applied to it, and produce a bright rapid flame which does no injury to the plant. It has been ascertained, that this vapor is volatile oil suspended in the atmosphere. Then there is the club moss (*Lycopodium clavatum*), the minute volatile seeds of which are highly inflammable, like powdered sulphur, and are used in Germany for artificial lightning on the stage. When dispersed in the air, they take fire with a candle, and suddenly explode.*

ESTHER.

In Captain Beechey's Voyage, we are told that the inhabitants of Pitcairn's Island and some others find an excellent substitute for candles in the *doodo* or candle nuts.† These

* Sir J. Smith.

† Beechey's voyage, vol. i. and Lord Byron's voyage to the South Sea Islands.

nuts are heart-shaped, and are about the size of a walnut. — They are strung upon the fibres of a palm leaf, and thus form a torch, which gives a very good light; but the only inconvenience is that these nuts give a considerable heat, and crack and fly about to the discomfiture of the persons who chance to be near them. The tree which produces them (*Aleurites triloba*) is large, bears a handsome blossom, and supplies ornaments for the ears and hair. It belongs to the order *Euphorbiaceæ*, and independent of the use which is made of its oily nuts, the inner bark yields a dark red dye, and the tree affords a gum with which the Otaheitans dress their cloth.



Aleurites Triloba.

HENRIETTA.

But the most curious candle which I ever heard of is that used in the Ferroe Islands, where the inhabitants kill the stormy petrel (*Procellaria pelagica*) in great numbers; and the bird is so fat and oily that they only pass a wick through its body, and it serves the purpose of a lamp.

MRS. F.

So we are told, on the authority of Pennant; but I believe the bird that produces the greatest quantity of fat, is the Guacharo (*Steatornis caripensis*) of South America, which the Indians destroy in immense numbers for its fat, which they eat. This singular bird is the first example of a nocturnal bird among the Passerine class. It is of the size of a fowl, and inhabits one of

the most spacious calcareous caverns known. It only leaves it at the fall of day, and makes its nests sixty feet from the ground. De Humboldt gives a most entertaining description of these birds, and of the periodical attacks of Indians upon them, which take place in the month of June.*

ESTHER.

In Iceland, the peasants split the wood of the pine, which they find buried in their bogs, and use it for candles, it being generally the only light which they have.

ESTHER.

The oak is also found in great quantities in the bogs, is it not?

MRS. F.

Yes, the oak is generally dyed black from the iron which exists in the peat. Attempts have been made to convert the bog oak into furniture, it being so hard and black as to equal ebony in the fine polish which it takes, and in color; but after a short time, it warps and cracks so much as to spoil its appearance, and, unfortunately, to prevent its adoption as a substitute for ebony. These trees are found immersed in the bogs at different depths, sometimes twenty feet below the surface.

ESTHER.

I read the other day, that experiments have been lately made upon preparing paper from turf or peat, which if the attempts should prove successful, will be the source of great advantage to Ireland.

MRS. F.

Let us hear what you have read. Various are the materials which have been tried as a substitute for linen. Paper has been made from straw; Chinese paper from the outer coats of

* Humboldt, Voyage, tom. iii.

a species of *Amaryllis*; French white paper from old rag and oakum; and English letter-paper has been made containing a large quantity of plaster of Paris: chopped hair, spent bark, wool combings, wood shavings, &c. have been tried, but without success; and lately the fresh-water *Conferæ* have been had in requisition, but they were found too fragile to endure bleaching.

ESTHER.

Certain kinds of turf were then tried; for all linen paper being composed of vegetable fibre, it appeared probable that peat, in a certain state, would be well fitted to the purpose. The bogs consist of various strata, varying in density and other properties, in proportion to the depth. The surface is usually covered with mosses, heaths, &c. in a living state; the stratum immediately beneath, usually consists of a tough, fibrous, light spongy mass, composed of the same kind of plants as those growing above, but in the first stage of decomposition; the vegetable fibre being unaltered, while the other organic substances of the plants are chemically changed. From this material the paper is made. The turf is macerated in a machine resembling a paper-mill, until its parts are fully separated without injuring the fibre; and a stream of water running through the machine, carries off the earthy and other extraneous matter; the strong woody stems of heath, &c. are then expelled, and the mass dried in an hydraulic press. By next exposing it to the agency of several chemical preparations, the fibres are brought into the state of a pure, white, fine pulp, fitted to be converted into paper, either alone or in combination with linen rags. The pigment called "Vandyke Brown" is also procured from the residue of this manufacture, as well as a species of artificial camphor. About eighteen pounds of the pulp may be procured from one hundred weight of crude turf; and pasteboard is made from it by a most simple process. The fibres of the turf lie nearly parallel; and the turf is therefore cut in pieces of about two feet square by three inches thick: when dry, it is placed in a close

cast-iron vessel, the air exhausted, and a mixture of dissolved glue and molasses, at a boiling heat, poured over it, which fills up all the pores. The turf is then subjected to the pressure of an hydraulic press, by which the superfluous fluid is expressed, and its substance reduced to about three eighths of an inch in thickness. It is, moreover, worthy of remark, that the kind of turf suited to the above purpose, is precisely that which is rejected for fuel.*

MRS. F.

Thank you, Esther. Should further experiments establish the promise held out by this account, the bogs, which are already the magazines of the richest manure, and of an inexhaustible store of fuel, may yet become in Ireland another of the most fertile resources for enriching the country. But it is almost time for our walk.

ESTHER.

Before we leave off, mamma, I wish to ask you about the tree which drops water.

MRS. F.

You allude to the *Cæsalpinia pluviosa*, a Brazilian tree, which is said to produce a shower of drops of water resembling rain, which are discharged from the points of the leaves of the plant; but one of the newest vegetable curiosities among the water-holding plants is described by Dr. Lindley as a native of the woods of Demerara. The plant is called *Coryanthes maculata*, and is of the natural order of Orchidææ. It is not uncommon in the woods of Demerara, where it is found hanging from the branches of trees, and suspending in the air the singular lips of its flowers, like fairy buckets, as if for the use of the birds and insects that inhabit its foliage.

* The above account is from the report of a paper read by Mr. Mallet at the meeting of the British Association, as given in the Dublin Penny Journal for November, 1835.

ESTHER.

How does it hold the water?

MRS. F.

The lip of the flower is furnished near its base with a yellow cup, over which hang two horns, constantly distilling water into it, and in such abundance as to fill it several times. This cup communicates, by a narrow channel, formed of the inflated margin of the lip, with the upper end of the latter; and this also is a capacious vessel, very much like an old helmet, into which the honey which the cup cannot contain may run over.

ESTHER.

What an interesting plant it must be! I should like very much to see it.

MRS. F.

We must now prepare for our walk.

HENRIETTA.

I see, aunt, that there has been a shower since we have been talking. Perhaps it will be over by the time we have put away our work.

MRS. F.

Who has seen my spectacle case?

FREDERICK.

Here it is, aunt: what is it made of?

MRS. F.

Of shagreen.

FREDERICK.

And what is that? it looks like fish-skin.

MRS. F.

No; real shagreen is the skin of the wild ass, prepared in a peculiar manner.

HENRIETTA.

Will you have the kindness to tell us how it is done, and where it is made?

MRS. F.

The principal manufactories of it are at Astrachan, and in Persia. All skins of horses or asses prepared so as to appear grained, are called by the Persians *sogri*, by the Turks *sagri*. The skins are soaked in pure water for several days; then stretched upon boards, and the epidermis or outer skin scraped off. The operation is then repeated, and the skin again extended upon wood. The upper side is besprinkled with the black, smooth, hard seeds of the *Chenopodium album*.

ESTHER.

That is a common plant in waste ground, as well as in the garden. The people about here call it "fat hen," and give it to their pigs to eat.

MRS. F.

That these seeds may make a deep impression upon the skins, a piece of felt is spread over them, and the seeds trodden down with the feet; and thus a strong indenture is made in the soft skin, which is then left to dry, and the seeds are shaken off. After this process is completed, the skin is once more scraped, and again put into water. As the seeds occasion indentation in the surface of the skin, the intermediate spaces, by the operation of scraping and smoothing, lose some of their projecting substance; but the parts which have been depressed or indented by the seeds, and which, consequently, have lost none of their substance, now swell up above the scraped parts, and thus form the grain of the shagreen.*

* London Encyclopædia, art. SHAGREEN.

ESTHER.

Then the part which is pressed down by the seeds, being unscraped, is thicker than the other, and therefore rises above it.

MRS. F.

Exactly so. Henrietta, open the window, and see if it still rains.

ESTHER.

No, it does not, mamma. How delightful the air is after the shower! How sweet the flowers smell!

MRS. F.

Yes; a heavy shower in summer brings out the perfume of all flowers. An hour ago, when the sun had heated and dried the air, we should have found the flowers comparatively scentless; but the dampness of the air brings out their perfume, and seems to produce a total change in the odoriferous organs of plants. I can smell the musk mimulus (*Mimulus moschatius*) most powerfully, although it is in the further bed of the garden.

ESTHER.

And the same difference is, I am sure, most perceptible between a morning and a noonday walk in autumn. "When the sun has dried the air, and the plants are ill able to bear his action, in consequence of the dryness of the source from which they draw their means of compensating for his evaporation, the garden is scentless;"* but walk in it before the dew has dispersed, when every herb, tree, plant and flower is "redolent with sweets," — when the air is impregnated with balsamic odors, and all nature appears to be offering up incense in morning sacrifice, in gratitude for the refreshment and rest of the night with its cooling vapors; — go into a garden then, and we must feel the truth of the beautiful words of the poet:—

* Lindley.

— Was ev'ry falt'ring tongue of man,
Almighty Father! silent in thy praise,
Thy works themselves would raise a gen'ral voice,
E'en in the depth of solitary woods,
By human foot untrod, proclaim thy power,
And to the choir celestial Thee resound,
Th' eternal cause, support and end of all!

THOMSON.

CHAPTER XX.

SEPULCHRES OF THE NATIONS OF ITALY.

TOMBS AT PÆSTUM.—BURNING AND BURYING THE DEAD.—HERCULES.
 —ROMAN TOMBS.—STRUCTURE OF THE SEPULCHRES OF CAMPANIA.
 —CYNÆRARY URNS.—CONTENTS OF THE SEPULCHRES.—LACHRY-
 MATORIES.—TOILET OF THE ROMAN LADIES.—ITALO-GREEK VASES.
 —MANNER OF PAINTING THEM.—ETRUSCAN VASES.—ANCIENT
 ETRURIA.—CITIES OF THE ETRUSCAN LEAGUE.—TOMBS AT TAR-
 QUINÆ.—CLESUM.—ETRUSCAN SCARABÆI AND MONEY.

What now of all that Rome or Athens grac'd?
 In war or conquest—wealth or splendor plac'd,
 Their gods—their godlike heroes—princes, powers,
 Imperial triumphs, and time-braving towers?
 What now of all that social life refin'd,
 Subdu'd—enslav'd—or civiliz'd mankind?
 What now remains?—

MOORE.

ESTHER.

HENRIETTA, come and look at this model of a Greek tomb,
 at Pæstum, which Mrs. Clifford has lent to me to show you.

HENRIETTA.

How curious it is! I see that the walls are painted, and
 there is some armor and a quantity of vases strewed about
 it, and a skeleton. I thought that the ancients burnt their
 dead.

ESTHER.

Not always; the Greeks and Romans sometimes adopted
 one mode, sometimes the other. Interment was the more
 ancient practice; and the bodies of infants, and of those who

were killed by lightning, were forbidden by law to be burned.

MRS. F.

Hercules is said to have been the first who introduced the custom of burning the dead. Having promised to take back Argæus, who was killed in the Trojan war, to his father Licymnius (the uncle of Hercules), and being unable to restore him alive, Hercules burnt his body, and carried back his ashes, in order not to fail in his engagement to the father.

HENRIETTA.

Then there was no regular rule observed with regard to the interment of the dead?

ESTHER.

No; it would appear, that both means being equally accessible, the survivors were free either to burn or bury the bodies of their departed relatives as they preferred.

MRS. F.

To judge from the results of the researches in Magna Græcia, it seems that the proportion of bodies interred to those burned was among the Italo-Greeks, as one to ten; whereas among the Romans, it was totally the reverse.

ESTHER.

The Greeks used to conceal their tombs, and placed them on the north side of their town; the Romans, on the contrary, liked to exhibit their sepulchres.

MRS. F.

As Madame de Stael observes, "Loin que l'aspect des tombeaux décourageât les vivans, on croyait inspirer une émulation nouvelle en plaçant ces tombeaux sur les routes publiques, afin que, retraçant aux jeunes gens le souvenir des hommes illustres, ils invitassent silencieusement à les imiter." This observation is made when visiting the Appian way, the

street of sepulchres, where numberless tombs and sarcophagi attest, at each step, the monumental grandeur of the Romans. But their private tombs were of a different description; they were placed under ground, and consisted of tiers of small niches, each of which held one or several urns. Here the master and the slave were buried together, and all that lived in one family, shared the same cemetery.

ESTHER.

This kind of family vault was called a columbarium, from its resemblance to the holes in which pigeons build their nests.

MRS. F.

It was so; but let us now proceed to the tomb of which you have the model, and which is one of the sepulchres of the Greeks of Campania.

ESTHER.

Are they all of the same construction?

MRS. F.

No; the tombs in Magna Græcia vary in their form and structure. Some are dug in the tufa, or rock; others are built of stone or brick, forming a room or chamber. Sometimes the bodies were burned, and the ashes placed in a cinerary urn, and buried in the ground, without any protection except, perhaps, a square stone over it. A porphyry urn was so discovered at Cuma, and to this mode of interment we are indebted for one of the finest painted vases in the Museum at Naples. It is called, from the subject depicted upon it, "The last night of Troy." For its form, design, preservation, and the fineness of its varnish, it stands in the first class of its kind. It was found in 1797, at Nola, so celebrated for its vases, and was enclosed in a vase of coarse earthenware, in order to protect it. It was full of human ashes, and buried merely in the ground.

ESTHER.

Had the ancients any particular form for their cinerary urns?

MRS. F.

It appears not; for they are found with two or three handles; and even simple plates have been discovered, containing ashes and burnt bones.*

HENRIETTA.

But, from this model, it seems that the tombs are full of curiosities.

MRS. F.

Their contents vary, of course, according to the condition of the individual interred. Those of the rich are full of objects of interest, and present a curious insight into the domestic life of the ancients. Some of those which are of large dimensions, have the sides of the walls of the interior covered with white stucco, upon which are painted figures in colors and gilding; and some are ornamented with bas-reliefs. In the centre of the apartment is laid the body, with an incense bottle on the breast, or, as they are termed, lachrymatories.

HENRIETTA.

Why were they so called?

MRS. F.

Not from holding the tears of the relatives, as is falsely imagined; but they were so denominated by the ancients, because, from the form of the neck of the bottle, the perfume fell from it drop by drop, as tears flow from the eye. Sometimes there are several of these incense bottles round the body, made either of glass, alabaster, or earthenware. It appears that these bottles were carried by the relatives to the grave, when the perfumes which they contained were poured over the body, and the bottles deposited in the tomb.

* De Jorio.

HENRIETTA.

What else does the sepulchre contain?

MRS. F.

On a patera, or dish, is placed the sop for Cerberus; and numbers of vases are arranged about the tomb, either standing on the floor, or attached with bronze nails to the walls. Men were buried with their arms, armor, dice, styles and tablets for writing, &c., according to their profession. Mirrors, rouge, combs, ivory and bone pins for the hair, ornaments, &c., are found in the tombs of the women; and children were interred with their dolls, marbles, and playthings.

HENRIETTA.

Of what were the mirrors made?

MRS. F.

Of bronze: but Pliny mentions mirrors of green glass; and Nero had an emerald mirror. The Roman ladies always carried their mirrors about with them; and it appears that they were acquainted with all the false additions of the modern toilet, and wore false hair, false teeth, false eyebrows and eyelashes, white paint and rouge; and sometimes they dyed their hair.

HENRIETTA.

What are the other contents of the sepulchre?

MRS. F.

It would be endless to enumerate all the various substances which they contain; amber, gold, silver, iron, copper, mother-o'-pearl, glass and rock crystal are of the number, besides several kinds of food, such as eggs, shell-fish, crustacea, wine, and the bones of birds.

HENRIETTA.

But were these beautiful vases only painted to place in the tombs?

MRS. F.

From what we can learn, it appears that they were frequently used in sacrifices and other religious ceremonies; they were given as prizes to the victors in the games, and were also kept for ornament, or appropriated to domestic purposes. The piety of the relatives led them, perhaps to decorate the tombs of their departed friends with the vases which they most valued during their lives, or which were most associated with their memory.

ESTHER.

In what state are these sepulchres generally found?

MRS. F.

Some have no earth whatever in them, except the small quantity which the ancients sprinkled over the body, at the time of interment. Other tombs are quite filled up with mould, either from the roof having given way, or from the excavations of the Romans, who sought the Italo-Greek tombs with great avidity, for the painted vases which they contain, and which, even at that period, were valued for their beauty and antiquity. In the time of Julius Cæsar, some Greek sepulchres were found at Capua when that city became a Roman colony; and, after ransacking them of their contents, the earth was thrown into the tombs, which also were sometimes used by the Romans as places of sepulchre for themselves.

ESTHER.

How were the ancient vases painted?

MRS. F.

The Italo-Greek vases are all of fine red pottery varnished; and the figures upon them are either painted in black upon the natural red ground of the vase; or the vase is grounded in black, and the figures left red (the draperies and features being traced out in black). The first description of vase is the most esteemed; and, as far as can be inferred from minute

examination, it was executed in this manner: After the vase had been baked once, the figures were lightly shaded out with a brush, dipped in a thin diluted mixture of the black varnish. The artists appear, like Raphael and the Italian painters, to have sketched the simple figure, and afterwards to have added the draperies. The figures were next filled up with black, the contours corrected, and finished off with fine sharp lines of the dark black varnish; and the drapery, features, and different details which occur inside the black figure, were picked out, either by means of a sharp point which removed the black, or by applying white or red colors over it. The vase was then again sent to the oven, which completed the process.

ESTHER.

And how were the others executed?

MRS. F.

Those of the second class, which had the figures left red, and the vase grounded in black, appear to have been executed by different persons; the inferior parts being left to inferior artists to perform. The first class, on the contrary, seem to have been entirely finished by the master; whereas in the second, a variety of hands may be traced in the drawing; and the reverse of the vase appears generally to have been done by a less expert artist. We may fairly suppose, that in this manufacture, which must have been pursued upon an extensive scale, the labor of the vases was divided among several persons, as would be the case with us. But to return to the vase: the figures were shaded out, as before, with a light tint of the black, or sometimes with a hard point, probably of metal. That the latter plan was sometimes used, is evident, from the lines which we see indented on some of the vases; but, probably, it was less generally adopted, from it being necessary to trace, in this manner, while the clay remained in its unburnt state, and the more fit to receive an impression; and, consequently, the vase, from being handled when in this tender state, was more exposed to injury and accident.

The other mode was therefore preferred. The outline being sketched, it was probably next carried to a superior artist, who corrected the proportions, traced the features, &c., and outlined the whole with a very thick line of the black varnish.

HENRIETTA.

Why did he use it so thick?

MRS. F.

Probably to afford an easier outline to those who had the task of grounding the vase in black, and who, from carelessness or inexperience, would (as is often to be seen in the vases) run the color upon the figure, which was left in red, and upon which it was indelible. The thicker, therefore, the outline, the less chance of it being passed; and in some of the vases, it feels quite raised to the touch. The figures and superior part of the drawing being finished, the vase was next passed to another artist, to draw the reverse, and to paint the borders and the minor ornaments; and another probably put in the white, or other tints which were added to the vase.

HENRIETTA.

Were there any other colors used?

MRS. F.

Yes; besides the black, white, blue, light yellow, bright red, and a very dingy red, were sometimes employed. The decorations being finished upon one vase, nothing remained but the black ground, which being added, the vase was sent to the oven for its second baking, when it was completed. There is a vase in the Museum of Naples which was found unfinished, and from that, and a careful examination of the others in the museum, the above conclusions are formed.*

ESTHER.

The modern imitations are easily detected by immersing

* See the works of the Canonico de Jorio.

the vase in spirits of wine, or sometimes merely by washing it with water, when the colors speedily disappear; whereas the ancient, being burnt in, are unhurt by this test.

MRS. F.

Their weight, and the color of the clay, are likewise means by which they may be readily distinguished, as also by the fineness of the varnish. When the vases are taken from the ground, they are generally covered with a thick white calcareous crust. This is removed by means of muriatic acid, which does not in the least affect the black varnish, so durable is the composition of which it is made. When we consider the rapidity with which they must have been executed; from the quick absorption of the colors by the clay, and the impossibility of removing the black lines on the red ground; we cannot but admire the more, the boldness and correctness of the drawing, and the elegance and grace of the composition. So widely were these vases diffused, that a Roman station being discovered near the Hague, many cups and vases of fine red pottery were to be seen among the ruins (in 1823), with the names of the Greek artists who had manufactured them, distinctly stamped on the under side.*

HENRIETTA.

But, aunt, you call these vases Italo-Greek; I thought that they had been Etruscan?

MRS. F.

That the Etruscans fabricated vases, as well as the Greeks, is acknowledged; but they may generally be distinguished from each other. The subject painted is usually the type of their origin. The varnish of the Etruscan vase is less brilliant; the earth of a different color; the ornaments less graceful; and the style of the figure, which is drawn in black upon the clay, has all the characters assigned to the Etruscan drawing. The want of proportions; the stiff attitude; the constrained position of the arms; the ill-drawn eyes; the long

* Gell's Topography of Rome.

beards and hair of the men; the winged genii; the arms, and other attributes, generally enable the antiquary easily to distinguish them, and are sufficient indications of their origin.

HENRIETTA.

Aunt, but I do not know anything about the Etruscans.

MRS. F.

Nor is much known respecting them. The history of Italy, before the dominion of the Romans, is involved in obscurity; and whether the Etruscans be originally of Lydian or of Egyptian origin, is quite uncertain. So little is known of this eminently distinguished people, that circumstances seem to confirm the idea that the Romans destroyed every thing relating to the records of ancient Etruria. Thus, although the Etruscans seem to have arrived at the highest points of civilisation, and even of luxury, at an early period, whilst Rome had as yet no existence, and to have been distinguished, in a variety of respects, far beyond the people of surrounding nations, we are almost wholly ignorant of their history, and even their origin is involved in the greatest obscurity. The Emperor Claudius is said to have written twenty books of Etruscan history, which are unfortunately lost.

ESTHER.

Were the Etruscan dominions extensive?

MRS. F.

There is proof that almost all Italy was, at one time, under the power of Etruria; and Capua was built by an Etruscan colony; but their dominion in the south of Italy must have been of short duration, as no traces of their language are to be found there. Their territories extended at one time, in the north, from Turin to the Adige, and they were only separated at one part of their confines from Rome, by the Tiber.*

* See Sir W. Gell's *Topography of Rome* for the above details.

ESTHER.

Which were the twelve cities of the Etruscan league?

MRS. F.

The enumeration of these cities vary. In one list we find the cities of

Cære — Cervetere,
Tarquinii — Turchina,
Populonia,
Volaterræ — Volterra,
Arretium — Arrezzo,
Perusia — Perugia,
Clusium — Chiusi,
Rusellæ,
Cortona — Cortona,
Vetulonium,
Cossa, and
Fæsulæ.

Veii, Vulsinii and Capena, which belonged to an earlier catalogue, had probably fallen when this enumeration was made, and their places were therefore supplied by the admission of other towns. At Cære, which is about thirty miles from Rome, many curious relics have been found; among others, figures of black earthenware, about four inches high, of an Etruscan divinity, represented with four wings, and tearing open its robe. The etymology of the word *cæremonia* may be referred to the circumstance of the priests of Cære having initiated the Romans into the mysteries of Etruria.

Tarquinii is about thirteen miles north of Civita Vecchia, and was, next to Veii and Clusium, one of the first cities of Etruria, and is now celebrated for the tombs which have been found there; but we will not mention individually each city of the Etruscan league, most of which afford interesting remains of Etruscan art. The Etruscans entombed their great men in tumuli, and excavations in the rock; many of these are to be seen; and, of the former, the tumuli of Tarquinii are the most celebrated, and their contents are eminently useful

in affording information relative to the dress, games, and customs of this lost nation. The tombs contained vases, arms, gold ornaments, &c.: and the rock in which they are excavated is so favorable to the preservation of the body, when the air was excluded, that a person who looked through the first hole made by the workmen, saw a body stretched on a bench with its garments in perfect preservation, but from the admission of the air, while he was yet looking, it sunk down, leaving only a picture of dust, of all that had once been there.

ESTHER.

How large are these chambers?

MRS. F.

About eighteen feet long by seventeen feet wide, and nine high. The ceiling of one, opened in 1828, was white, ornamented with red stars. A frieze generally runs round the chambers, on which are painted the games which had been celebrated at the funeral of the deceased. The figures in these tombs are generally well executed, though not with the elegance of Grecian art. It is singular that the men are all colored red, like the Egyptian paintings in the tombs of the Theban kings. Their eyes are very long, their hair is black and bushy, their limbs lank and slender, and the facial line projecting remarkably, so that the outline of their face resembles strongly that of the Negro, or of the Æthiopian figures of Egyptian paintings. They wear round their ancles rings as ornaments, and armlets on their arms. Shawls of oriental patterns are also worn by both men and women.

ESTHER.

What are the games depicted on the friezes?

MRS. F.

Wrestling, leaping, running, boxing, chariot-races, horse-races, cudgel-playing, and riding at the ring. The tombs at Viterbo, are ornamented in the same manner, and are cut out of the rock; this place and Tarquinii presenting a series of

tombs which can only be compared, in number and extent, with those in the valley of the kings, in Egypt. When I was in the Val di Chiana, in the vicinity of Chiusi, (the ancient Clusium,) we visited an Etruscan tomb,* which had been discovered when sinking a well, the workmen having come to the stones of the roof, by which they entered into the sepulchre, which is built of uncemented blocks of travertine; the doors consist of two large stones, with circular projections at the top and bottom, which fit into corresponding holes in the framework of the door, and thus form the hinges. The sepulchre originally contained eight sarcophagi, all of men. The subjects of the bas reliefs upon them are hippocampi, medusas, a bacchante on a leopard, &c. The stone of which the sarcophagi are made is very sonorous.

ESTHER.

Did you visit Clusium?

MRS. F.

We did so; and although there are no remains of the celebrated mausoleum of Porcenna, there is much to interest in Etruscan antiquities. Vases of every description, from the black pottery to the highly finished painted vases; but that which interested me the most was the different collections of Etruscan scarabei, which are found in the fields when ploughed, or after heavy rains. They are mostly on cornelian, and are perforated in their longest diameter. From some having been found mounted as rings, it would appear that they were destined for this use; probably as signets. The Etruscans were celebrated for their engraving upon stones both of cameos and intaglios, as they were also for their works in terra cotta, in brass, gold, &c. At Athens, the metal cups and vases of Etruscan workmanship were highly prized.

HENRIETTA.

What was their money?

* Sepolcrete della Paccianese, discovered in 1820-21.

MRS. F.

No Etruscan coin in silver is known, and very few circular coins are found; but Plutarch says that the most ancient money was in rods of brass or iron, cut off at certain lengths and marked VI, XII, &c. A number of these broken and figured bars have been discovered; from their different lengths it is evident that the balls or knobs, whether placed on the stem, or between the branches, indicated the value of the bar. Several had six balls or fruits; many had three: some of the larger pieces have also double knobs. This seems a most simple and natural, and not an inelegant manner of producing the effect of coinage, and the mystery is at once explained of the early Etruscan money, and the existence of so many pieces of stamped metal as have been found from time to time in the country. The more we enter into the study of the remains of Etruria the more interesting it becomes, and -time and further investigation may probably throw more light upon its history, and enable the learned to decide upon the oft-disputed point of whether it is to Egypt that we are trace the first origin of Etruscan arts and civilisation.

CONCLUSION.

Such is the bliss of souls serene,
 When they have sworn and steadfast mean,
 Counting the cost, in all to espy
 Their God, in all themselves deny.

O could we learn that sacrifice,
 What lights would all around us rise!
 How would our hearts with wisdom talk,
 Along Life's dullest, dreariest walk!

We need not bid for cloister'd cell,
 Our neighbor and our work, farewell,
 Nor strive to wind ourselves too high,
 For sinful man beneath the sky..

The trivial round, the common task,
 Would furnish all we ought to ask;
 Room to deny ourselves; a road
 To bring us daily nearer God.

KEBLE'S *Christian Year*.

THE time was now approaching when Henrietta and Frederick were to return to school. The little circle viewed the separation with sorrow, but none felt it so acutely as Henrietta, who loved Mrs. Fortescue and her cousins, as if they had been her mother and her sisters.

The evening before their departure, when she wished her aunt "good night," Henrietta's overcharged heart could contain itself no longer, and she burst into tears.

Mrs. Fortescue kissed her affectionately.

"My dear Henrietta," she said, "I am sure that we all feel the parting from you very much, but we will look forward, God willing, to meeting another year, should your

father and mother still leave you under my care. The opportunities which we have lately enjoyed, have not, I trust, been left unimproved by any of us, but have proved to us all the source of instruction and advantage. My great aim in our conversations, has been early to accustom you, to place all instruction upon a religious basis; to render all knowledge such as will make you wise unto salvation, and, above all things, to recognise the God of nature in all his works, to see

‘Him first, Him last, Him midst, and without end.’

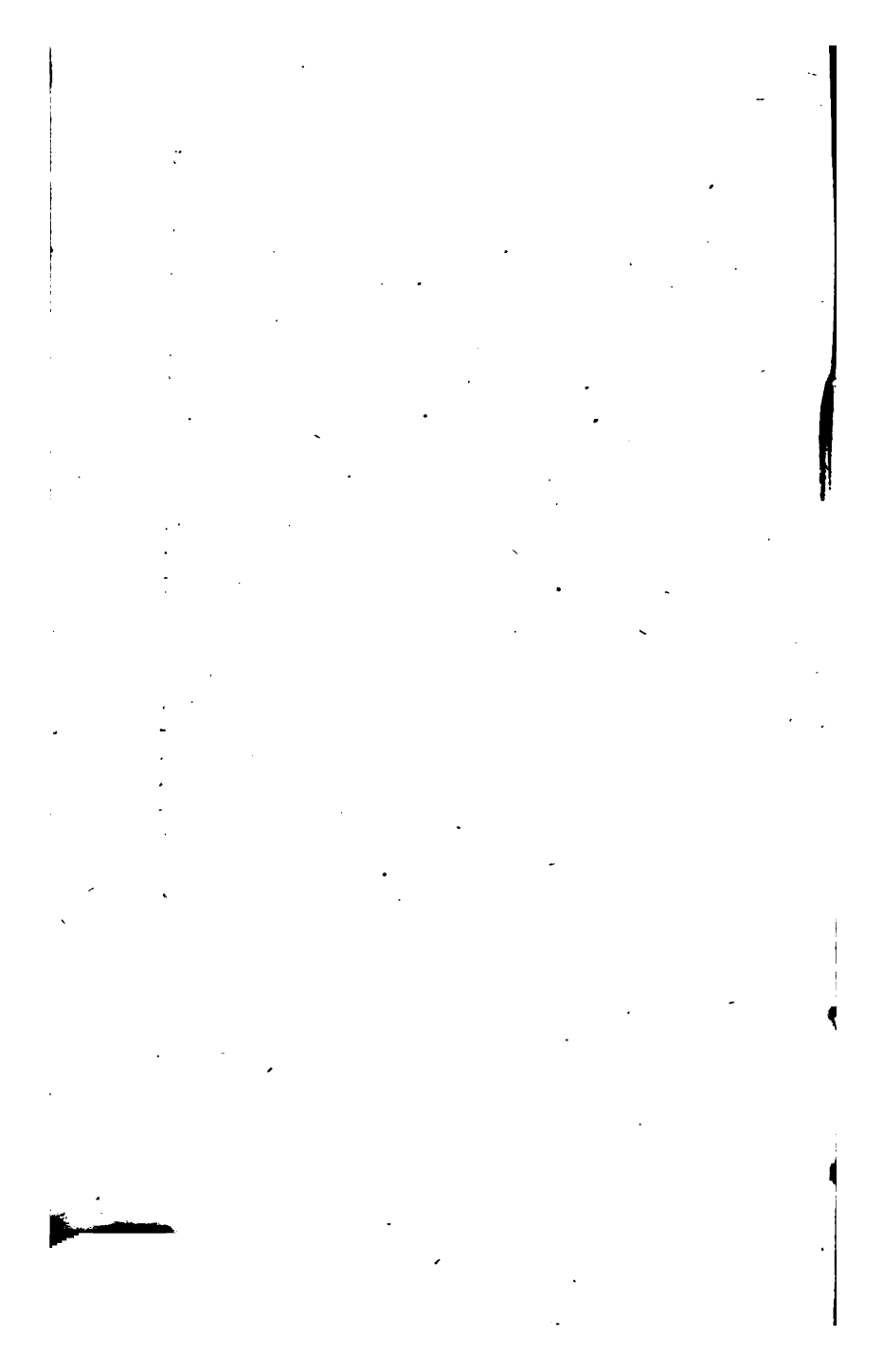
“If God be robbed of his glory, how can we expect a blessing upon our labors? and, as we are all called upon to walk by faith, and not by sight, it is essential to lead you to see God in all things, and to trace him who is himself invisible, in those outward manifestations of his power and goodness, which are within the reach of our finite observation.*

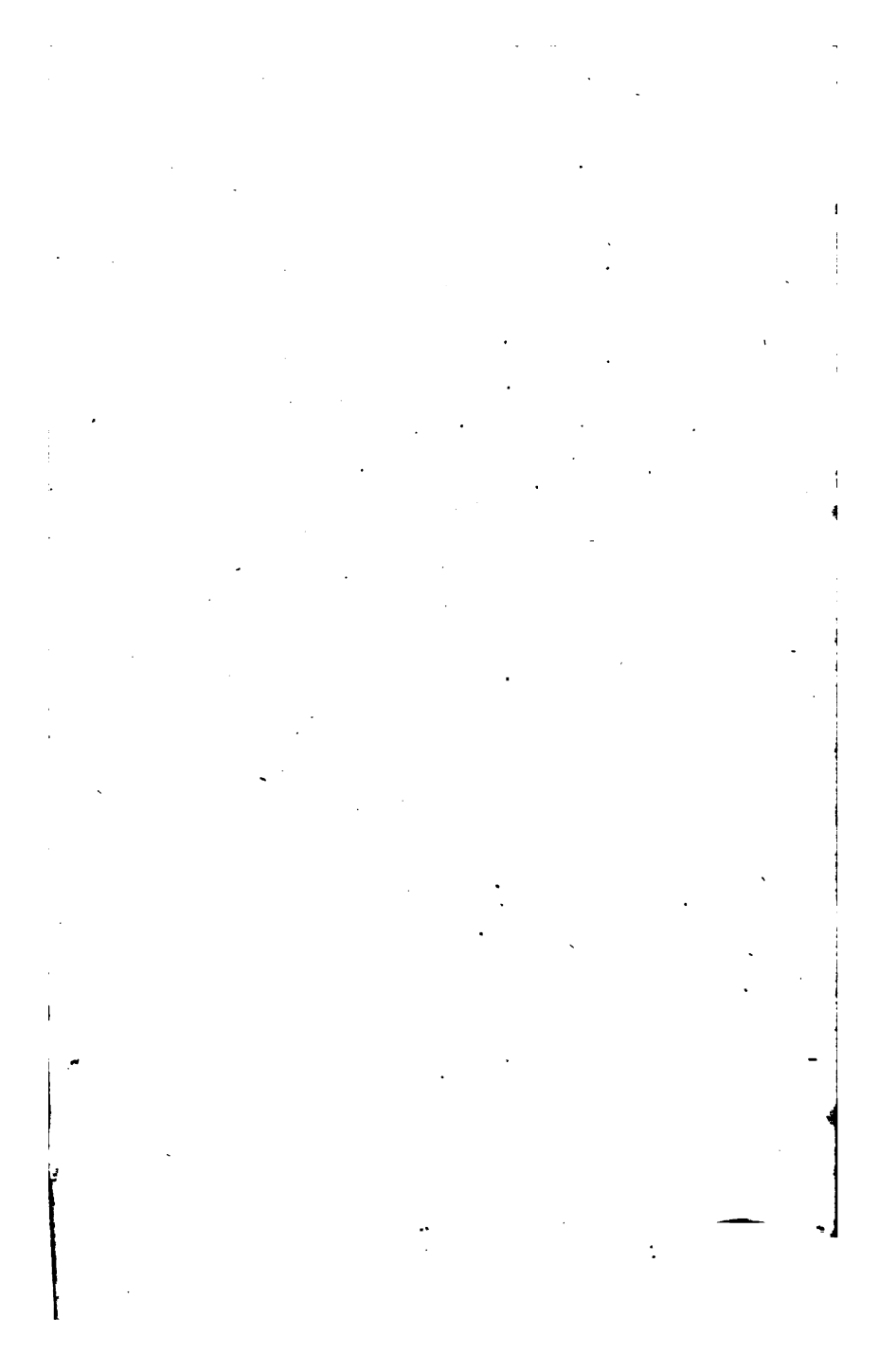
“Such has been the object of all my instructions; such, I trust, under God’s blessing, may be its result.

“Then may I, indeed, look forward to the highest reward which an anxious parent can hope for (for as a parent I feel towards you all), that of being permitted to witness the success of my humble labors, by seeing you happy in this world, and being allowed, through the merits of our Saviour, to say, when we all meet in the presence of our Maker — ‘Of them whom thou gavest me have I lost none. Behold I and the children whom the Lord hath given me.’ ”

* Mayo.

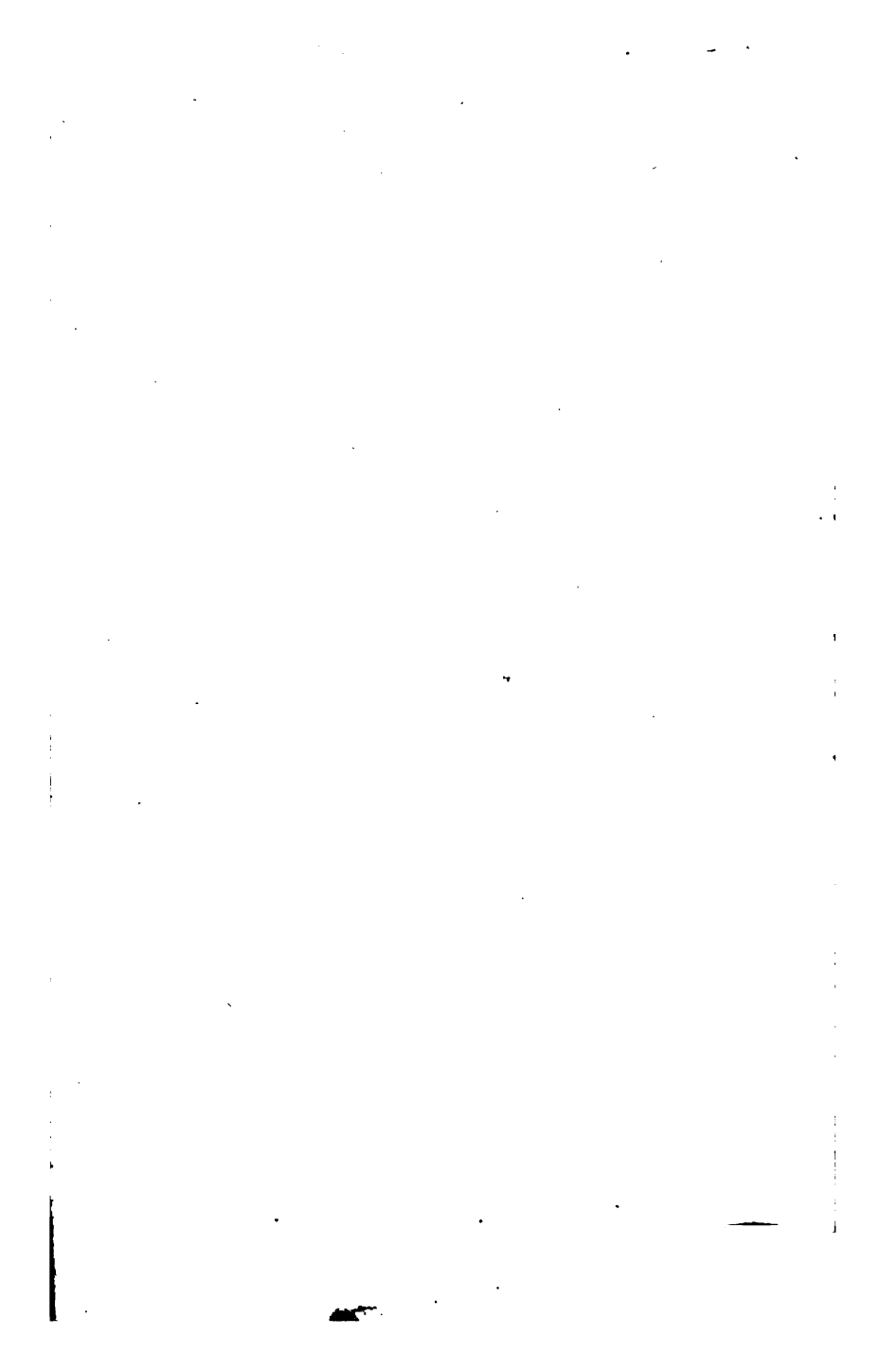
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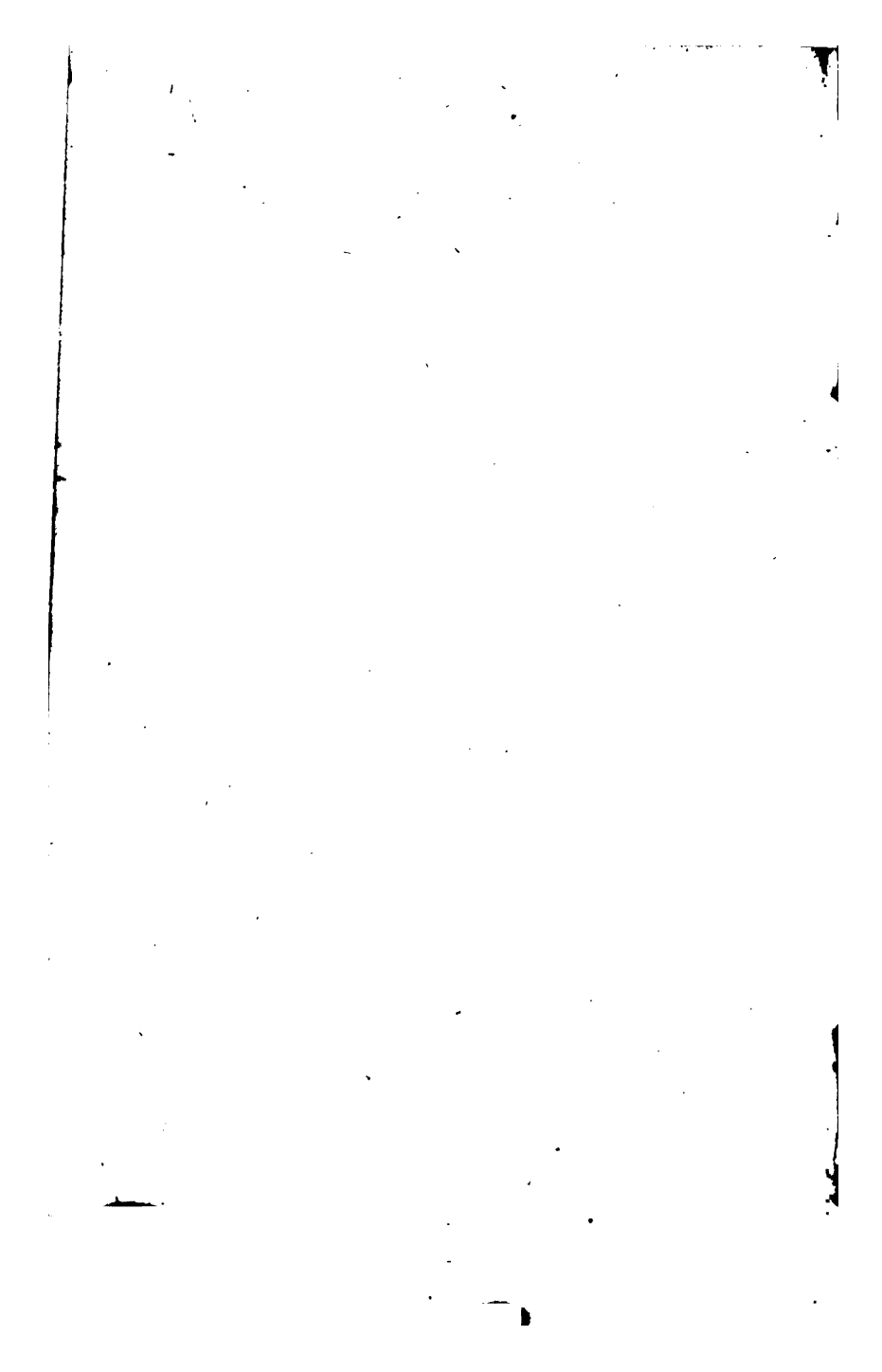












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